THE MOSAIC RECORD AND MODERN SCIENCE

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THE

MOSAIC RECORD AND MODERN SCIENCE.

By L. T. TOWNSEND, D. D.

AUTHOR OF "CREDO," ETC.

I have noticed that when theological writers can be induced to stick to the literal account in Genesis, and scientists to the pure facts, that the two records have a very wonderful correspondence.

PRES. McCOSH.

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PREFACE.

Many Sabbath-school workers and Bible students have felt and expressed surprise that during the late discussions and explanations of the International Lesson Series, the Mosaic account of creation received such unsatisfactory defence. Though familiar with the current difficulties and objections, and in some instances unable to answer them, still the teacher and the student had not been alarmed; they presumed, that, when this subject should be critically examined and commented upon by the pulpit and the press, perfectly satisfactory explanations would be given. But as a matter of fact, we have to confess that a large number of even the more common objections either were not well met, or were passed in silence.

Now, only a moment's reflection is needed to show how unreasonable is the demand that all difficulties should be exhaustively examined and satisfactorily reviewed in the studies of a few weeks. The space devoted to the introductory chapters of Genesis was necessarily too limited, the scientific researches demanded were too extensive, and the theological and exegetical questions involved were too profound to admit, within the

limits of International Series, anything like exhaustive treatment.

These facts, and the many new questions raised, together with the interest developed in the minds of all the friends of the Bible, have led the author to contribute the following brief treatise to the general literature belonging to this somewhat difficult and perplexing subject.

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THE

MOSAIC RECORD AND MODERN SCIENCE.

I.

CONFLICT OF THEORIES.

THE Christian student, while examining the different scientific theories of the origin of the world, and while studying the various interpretations given to the Mosaic record, is often left to wonder if these conflicting opinions can ever be reduced to anything like consistency.

Controversies upon these subjects have arisen, not exclusively between skeptical scientists and religionists, but have also been warm and exciting even among those who are firm believers in the truths of Revelation.

There have been those, for instance, who maintain that the Bible teaches, beyond question, that God, in six ordinary days, begun the world and brought it, during that brief period, to its present inhabitable condition. The more scientific believer replies, however, that, judging from a candid view of facts, it cannot be possible that the various geological deposits could have been arranged without consuming millions of years. But to this it is sometimes rejoined, that God could have created the geological deposits and fossils just as they now are as well as to have created them in any other way. That he *could* have done this, no firm believer in the supernatural doubts, but that he *did* this, no intelligent believer at present will for a moment admit.

On the other hand, a large number of Christian scholars evade the scientific difficulties involved in the literal six-days' theory by asserting that the word "day," as used in the first and second chapters of Genesis, means a period of indefinite length. Hence, according to this interpretation, all that is required to establish a harmony between science and Revelation, is to show that the general order of development is essentially the same in both the Mosaic and scientific records. This, it may be remarked, is the view now maintained by perhaps the majority of scholarly commentators and scientific believers, who during the last fifteen or twenty years have written upon these subjects.

That this theory is entirely free from embarrassments, however, none of its advocates venture to affirm. It may be, and certainly is, a temporary relief from scientific, but it is not a relief from exegetical difficulties. Indeed, no one, unless in support of some favorite theory, or to escape some embarrassment, would read the Mosaic account thinking for a moment of any period except that of a literal day. And further, this, which seems to be the natural interpretation of common sense, is likewise supported by some of the ablest and most critical Hebrew scholars of both ancient and modern date. Says Baumgarten: "The word 'day,' the Hebrew *Yom*, is primarily day, and not period; and here (in Genesis) this word is used for the first time." Rosenmüller contends, also, that this Mosaic account cannot possibly be made to mean other than days of twenty-four hours' length. The learned and eminent Hebraist, Kalisch, says, "It is philologically impossible to understand this word 'day' in any other sense than as a period of twenty-four hours." Says Professor Hedge, in his *Primeval World*, "There is no reason to doubt that the text means literally days of twenty-four hours." Calwer, Hagenbach, Keil, Davidson, and Professor Murphy maintain the same opinion. We have to confess, therefore, that the usual method of explaining the Mosaic account, as meaning days of indefinite length, is not such as can easily harmonize the facts of science with a natural and obvious interpretation of the Bible.

Aside from the length of days, there are other matters in controversy. For instance, not a few writers, adopting the theory that the Bible was never designed to teach science, have surrendered all claims as to the

inspiration of the Mosaic account, save some general truths as to God's creatorship. They have styled that account, in the words of Dr. Cocker, "poetical, symbolical, and unchronological." Others resolutely oppose this view, and say, with the late President of Amherst College, himself a scientific man of no mean rank, "If the supposed results of scientific discovery should be found to be antagonistic to the Bible, I should cleave to the Bible and suspect the results." [1] *

Such are some of the conflicting views, even among evangelical believers.

Aside from these controversies found within the household of faith, there have also been at the hands of pronounced unbelievers heavy assaults upon the Mosaic record. "A piece of stupidity and fraud," is the charge often made. Therefore the effort to find a harmonious adjustment of these conflicting opinions of theologians, scientists, and skeptics, as to the origin and formation of the world, seems well-nigh hopeless. Still, while the Christian has faith that the Bible is a God-made and not a man-made book, and while he believes that the same Being who inspired the Bible also created the universe, and must therefore have known how it was created, there is but one course to pursue — keep attempting adjustments until sooner or later one that is reasonable and harmonious shall be discovered.[2]

At the cost of subsequent repetition, but at the gain of clearness, we briefly outline a theory upon this perplexing subject, which at least somewhat reduces the number of difficulties heretofore met with. This theory maintains, in common with all recognized scientific opinions upon the subject, that the evolution or creation of the physical universe, including our earth, has consumed periods of time so vast that the human mind cannot comprehend them. With those who hold that the word "day" is indefinite, our theory agrees so far as to admit that apparently there are, in geology at least, six well-marked periods "of activity," having immense durations, which may be properly termed cosmical, or geological days, and that these periods are prophetic or typical of six literal days, during which the Creator brought into being the vegetable and

* The notes in this volume are indicated by the small Arabic numerals, 1, 2, 3, &c., and constitute the Supplement. (See p. 61.)

animal life now found upon the earth's surface. It will be noticed, by adopting this theory, that we avoid a quarrel with scientists as to geological durations, all the time being allowed that can reasonably be demanded. Nor need we quarrel with those exegetes who apparently are correct when insisting that the word "day," used in connection with "morning" and "evening," must mean an ordinary day. Each extreme party in this controversy, we concede, has truth on its side, but not the whole truth.

II.

COSMICAL PERIODS: THE FIRST, SECOND, AND THIRD.

In unfolding the subject, we first call attention to certain apparently well-established facts as to the beginning of things. We say, 'apparently well established,' in order to allow the science of geology to shift its ground in the future, as in the past, if new data should so require.

The field before us is immense. In traversing it, human history is the first informer, carrying back the student, with reliability, however, only a few thousand years. Nearly where human history begins, geological history takes the student and conducts him with something of a firm tread to a period when the lowest stratified rocks were formed. Beyond this point, geology ventures to report but little.

Next, the united sciences of astronomy, spectrum analysis, and chemistry, beginning where geology is compelled to stop, aided by analogical arguments and reasonable conjectures, carry the student back to the realms of those invisible forces which must have produced visible phenomena. If investigation is extended further, it will be found that history, geology, astronomy, spectrum analysis, and chemistry are compelled to commit all additional research to theology, which deals with data that lie beyond the reach of all other sciences.

In view of the fact that the nebula hypothesis has such strong support, being first propounded by Swedenborg, accepted by Kant, elaborated by Laplace and Herschel, having also been held and variously applied by such scientists as Cuvier, Humboldt, Arago, Guyot, Nichol, Proctor, and Dana, we feel justified in adopting it, at least as a working hypothesis.[3]

Keeping for the present within the circle of the natural sciences, the comparatively well-supported induction quickly follows, that, first of all,

and back of all, there was a dark and empty universe. From some cause, by creative power, or by chance, or by the nature of things, or otherwise, this empty space was filled, fully or partly, with highly illuminated and highly rarefied "star-fire" or "star-stuff." And this change from darkness to light, science likewise affirms, must have been instantaneous.

It is well to bear in mind at this point that one of the most pronounced postulates of modern science is, that there can be no effect without an adequate cause. This compels science to take the additional step, that an invisible and unknown, but nevertheless a Potent Agency, evoked from the invisible and unknown, this star-stuff, and then while the star-stuff was enveloped in primitive darkness, and while it was itself darkness, that same Potent Agency which evoked it into being, also set it on fire, and thereby dissipated the darkness of a past eternity.

Let it be observed that we do not yet attribute to science the word God. We go no further than pure science authorizes us. The terms we use are, an invisible and unknown, but Potent Agency, and it was this which brought into existence that which was not.[4]

How or why this Potent Agency brought "star-stuff" or "light-stuff" into being, or definitely what this Potent Agency itself is, physical science cannot from the nature of the case report; it should therefore properly refer for information to theology. But until new scientific information reaches us, we shall venture to fill this practically atheistic (not scientific) hiatus with the sublime words with which Moses describes certain later phenomena that were typified by those events which transpired millions of ages earlier: "And God said, Let there be light; and there was light."

There followed in order of time, according to astronomical and geological history, a distinct "epoch of development." The universally diffused "star-fire," by processes of concentration and condensation, formed rings, which, as Sir William Thomson thinks, resembled in form and preliminary movement those vapor-smoke rings that on a small scale are sometimes sent out of a locomotive during its first few exhausts.

As this era wore on, the flaming rings broke asunder forming distinct

masses of fire. At that time our earth threw off its satellite and became a well-defined sun, rolling through the spaces a flaming torch, giving out light and heat as does the sun which now lights and warms our planetary system.

In a word, this first cosmical day, it may reasonably be concluded, witnessed the creation of light, the conversion of light, through processes of condensation into rings, then into globes of fire, the earth, sun, moon, and stars being thereby shaped, and brought from confusion into order. Or, using a phrase in which Herbert Spencer delights, "the homogeneous became heterogeneous."[5] And no scientific man, be he skeptic or believer, can do better than say, that that primal darkness which had no beginning, and that morning light which first emblazoned the spaces, together with other astronomical phenomena, constituted the primitive day or epoch of the physical universe, or, in the simple yet scientifically faultless language which Moses designed for later phenomena: "And God saw the light, that *it was* good: and God divided the light from the darkness. And God called the light Day, and the darkness he called Night: and the evening and the morning were the first day."

The length of that epoch is beyond all our powers of comprehension. It could not have been less, as is thought, than the time which has elapsed since the earth's crust began to form, making, therefore, this first creative day to be, according to the earlier estimates of Sir William Thomson, at least three hundred million years.

As this day approached its evening the earth-fires burned less intensely than at mid-day. The flames at length entirely ceased to leap up from the earth's surface. They smouldered, and then a solid crust began to form. The surrounding gases were condensed, forming water and acids which were precipitated upon the earth, hastening its cooling, and also corroding and dissolving much of its surface materials. And when at length the surface fires were completely out, and when the crust had fully formed, though still hot enough to throw the descending waters back in the form of steam, and while these masses of steam and clouds were creeping over the sky, a great astronomical night shut down upon the earth, whose first day had consumed these hundreds of millions

of years. It was a night of wildest thunder-storms. "An overwhelming pall of clouds," says a popular lecturer, "covered the earth at this period, which at length fell in raindrops, and these exploding on their encounter in mid-air with the vapors rising from the earth, produced a universal tempest with thunder and lightning, which tempest lasted through a geological period. The planet Jupiter is now passing through this stormy period."

How long this black pall hung over the earth we have no reliable means of knowing. We may reasonably conjecture that its duration extended through years numbered by millions. The close of this night found the earth entirely deluged.

Like every other night, this one was at length greeted by a dawn-light, at least by a season of changed geological conditions, formations, and developments. That is, geological science positively reports that the primitive crust or rock-bed of the earth was anon broken up, thereby disclosing those fires which had been concealed through the previous night. In a word, the terrestrial fires had again broken out. From one pole to the other, and round its entire surface, the world was torn by earthquakes, and was lighted up in every direction by volcanic fires. Huge masses of the primitive stratified rocks were piled up in folds and then were repeatedly sunk in these seething seas of liquid fire.

The cause assigned by science for these mighty physical changes, is, the cooling and contracting of the surface matter of the earth. Of these changes and revolutions there is abundant proof. For instance, the oldest rocks of which geology has taken note, are those in the *Laurentian* system, belonging to the *Archæan* epoch. But these are stratified or fragmental, and are therefore formed from the debris of other and earlier rocks, and give evidence in many places of intense heating and sudden cooling. These earlier rocks constituted the primitive earth-crust of which we have just spoken.

It was during the closing hours of this second creative day that the broken and fragmental crust of the earth formed another covering for the suppressed fires. Mountain ranges made their appearance and a new series of rocks was formed. The moistures of the atmosphere likewise passed through marvellous chemical changes. Then it was, as is shown

by Professor Hunt, that the carbon and carbonates, the sulphur and sulphates, the chlorides and waters, representing so much carbonic, sulphuric, and hydro-chloric acids and aqueous vapor, were extracted from the atmosphere which in those early times enveloped the earth. Fragmentary rocks were fused and macadamized. Then also was formed the geological series consisting of gneiss, granite, hornblende, and the sandstones. In Canada, the thickness of these formations or measures is forty thousand feet. In Bohemia and Bavaria, the thickness is even greater, being not less than fifty thousand feet. During these geological and chemical changes the atmosphere, though not perfectly clear, became an agent, through processes of evaporation, or possibly by other means, in separating the dense aqueous vapors into two masses, one below, the other above the atmosphere. It is estimated that 186,240 cubic miles of rain-water fall annually; enough to submerge Asia, Africa, Europe, North and South America with water three feet deep. The average weight of water, or, strictly speaking, aqueous vapor, continuously held in the air, well-nigh baffles human comprehension.

This immense weight, estimated as high as 50,000,000,000,000 tons, did not originate in the sky, but was raised above the earth's surface and suspended. Therefore without violence we may also, through rhetorical accommodation, apply to this period the language of Moses:

"And God said, Let there be a firmament in the midst of the waters: and let it divide the waters from the waters. And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament: and it was so. And God called the firmament Heaven. And the evening and the morning were the second day."

Of the length of this second day, all our judgments must be conjectural. Le Conte, estimating from the time needed to form a thickness of forty or fifty thousand feet of the rocks belonging to this period, concludes that its duration is greater than the entire subsequent history of the earth. If this is the case, then, according to the conjecture of Sir William Thomson, the length of this volcanic day was not less than one hundred million years.

After another "cycle of repose," called properly a cosmical evening

and night, a new era of activity, development, and organization dawned upon the earth. Geologically it is easily distinguishable from both the preceding and succeeding days. "The rock system," says Le Conte, speaking of this epoch, "is distinct, being everywhere unconformed to the *Laurentian* below and to the *Secondary* above. It stands out the most distinct era in the physical history of the earth. The former or *Archæan* period must be regarded as the mythical age. But here, with the *Paleozoic*, commences the dawn of established geological history."

During the morning hours of this new day the *Silurian* system, sometimes termed the age of *Mollusks*, was formed. During its noon hours the *Devonian* system, sometimes termed the age of *Fishes*, was completed. And during its afternoon hours the *Carboniferous* system, sometimes termed the age of *Amphibians*, came into being and was completed. It was also during this period that the vast deposits of coal were formed and stored. The atmosphere was warm, humid, uniform, highly carbonated, stagnant, and stifling. Under such conditions the growth of vegetation was enormous and probably such as never again in this world can be witnessed. With great propriety we might apply to this period the words of Moses:

"And God said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear: and it was so. And God called the dry land Earth; and the gathering together of the waters called he Seas: and God saw that it was good. And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit-tree yielding fruit after his kind, whose seed is in itself, upon the earth: and it was so. And the earth brought forth grass, and herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself, after his kind: and God saw that it was good. And the evening and the morning were the third day."

The duration of this *Silurian*, *Devonian*, and *Carboniferous* day can only be relatively and approximately conjectured. The estimates of Bischof and Le Conte call for a million years for the coal period alone. If we allow the same time for the two remaining divisions, then this third cosmical day lasted three million years.

III.

COSMICAL PERIODS: THE FOURTH, FIFTH, AND SIXTH.

THE *Paleozoic* era was followed by another night, or "lost interval," or "collapse and subsidence," as modern geologists have variously denominated it. Of its duration we know not much. But we know that it had an end, then a morning, and was followed by another era of activity and development. It was upon this fourth cosmical day that the sun, moon, and stars gave their light to the earth. Hitherto, the atmosphere had been loaded with vapors and gases, especially with carbonic-acid gas. The sky had been obscured, especially with smoke from active volcanoes, and with vapors from "the steaming lands just arisen from their watery sepulchre." Indeed, up to the preceding day, the earth, being self-luminous, and therefore casting no shadow behind it, was so conditioned as to render the succession of day and night impossible.

But upon this, which may be termed the first true solar period, the weird light previously prevailing, often compared by scientists to the "zodiacal gleam," the "dying photosphere," and the "shimmer of the aurora," gave place to light under the same conditions as now greets the world in day-time. There was a veritable dawn-light and a veritable sunrise. With manifest propriety, therefore, the words of Moses, not literally, but through rhetorical accommodation, may be applied to this geological era:

"And God said, Let there be lights in the firmament of the heaven, to divide the day from the night; and let them be for signs, and for seasons, and for days, and years; and let them be for lights in the firmament of the heaven, to give light upon the earth: and it was so. And God made two great lights; the greater light to rule the day, and the lesser light to rule the night; he made the stars also. And God set them in the firma-

ment of the heaven, to give light upon the earth, and to rule over the day and over the night, and to divide the light from the darkness: and God saw that it was good. And the evening and the morning were the fourth day."

The duration of the cosmical epoch, now under consideration, with its succeeding lost interval, was probably not much less than that of the preceding day and night.

The night of the solar day was succeeded by another formative and organizing period, called by geologists the *Mesozoic* era or age of *Reptiles*. The earth's climate was of high temperature and quite uniform. Fossils of tropical and sub-tropical flora and fauna belonging to this era are found as far north as Spitzbergen.

During its morning hours, which constitute the *Triassic* period (consuming ten thousand ordinary days and nights), were formed vast accumulations of rock-salt. During its noon hours, which constitute the long *Jurassic* period, were formed fossil and petrified forests. At that time also were made the ponderous footprints upon the Connecticut sandstones. During its afternoon hours, which constitute the *Cretaceous* period, were formed immense deposits of carbonate of lime.

But the culmination of reptiles is the most distinguishing characteristic of the *Mesozoic* era. All the fauna, including birds and mammals, were reptilian. Professors Dana, Cope, and Le Conte call attention to the fact that there are in the world at present only six varieties of reptiles over fifteen feet in length. But in the *Cretaceous* of Great Britain alone there were not less than eighteen varieties which were from twenty to sixty feet in length. In the United States, one hundred and forty-seven fossil species of reptiles belonging to this period have been found, some of them gigantic in size, being from seventy to eighty feet in length. Hence, had the author of the Book of Genesis intended a description of this period, he could not have done much better than to say:

"And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven. And God created great whales, and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind: and God saw that it

was good. And God blessed them, saying, Be fruitful and multiply, and fill the waters in the seas, and let fowl multiply in the earth. And the evening and the morning were the fifth day."

The duration of this epoch, like that of the others, baffles definite calculation. From one to three million years are the various and approximate estimates.

The close of this period was a time of continent making. The western half of America underwent a "bodily upheaval." The great *Cretaceous* sea which had hitherto divided North America was drawn off, and one continent took the place of two. The Wahsatch and Uintah mountains were formed, while the eastern range of the Rocky Mountains was greatly elevated. These physical changes witnessed the devastation of nearly all the flora, and the destruction of nearly all the fauna which had hitherto characterized this era.

There followed, as geologists affirm, another lost interval, or night, called the *Permian Laps*, from whose darkness at length dawned another, the sixth, cosmical epoch. A new flora and fauna took the place of the old, ushering in the era familiarly known as the *Tertiary*, or *Cenozoic*, which includes the *Eocene*, *Miocene*, and *Pliocene* formations. Animals and plants such as had flourished in no previous age were to be everywhere met. It was emphatically the era of mammals. Professor Dana's description vividly portrays the animal life of those times:

"The quadrupeds did not all come forth together. Large and powerful herbivorous species first take possession of the earth, with only a few small carnivora. These pass away. Other herbivora with a larger proportion of carnivora next appear. These also are exterminated; and so with others. Then the carnivora appear in vast numbers and power, and the herbivora also abound. Moreover these races attain a magnitude and number far surpassing all that now exist, as much so indeed, on all the continents, North and South America, Europe, Asia, Africa, and Australia, as the old mastodon, twenty feet long and nine feet high, exceeds the modern buffalo. Such, according to geology, was the age of mammals, when the brute species existed in their greatest magnificence, and brutal ferocity had free play; when the dens of bears and hyenas, prowling tigers and lions far larger than any now existing, covered Britain and Europe. Mammoths and mastodons wandered over the plains of North America, huge sloth-like Megatheria passed their sluggish lives on the pampas of South America, and elephantine marsupials strolled about Australia. As the mammalian age draws to a close, the ancient carnivora and herbivora of that

era all pass away, excepting, it is believed, a few that are useful to man. New creatures of smaller size peopled the groves; the vegetation received accessions to its foliage, fruit-trees and flowers, and the seas brighter forms of water life. This we know from comparisons with the fossils of the preceding mammalian age."

"One of the most noteworthy facts connected with the first mammals," says Le Conte, "is the apparent suddenness of their appearance in great numbers. The earth seems to swarm with mammals." The *Eocene* basin of Paris, studied by Cuvier; the Siwalik Hills of India, studied by Falconer; the *Miocene* and *Pliocene* of Europe, studied by Flower and Lyell; the Green-River basin of the United States, studied by Marsh and Cope; the Mauvaises Terres of Nebraska, examined and described by Hayden and Leidy, — tell the same remarkable story of the huge proportions of the mammalia of the *Cenozoic* era. There was the massive *Dinothere*, combining in its structure the character of the modern Elephant, the Hippopotamus, the Tapir, and Dugong. There were also the *Sivathere*, a four-horned antelope of elephantine proportions; the *Dinocerus*, likewise ponderous in size, armed with three pairs of horns and one pair of tusks. There were the *Bramathere*, the different varieties of the *Rhinoceros*, of the *Hippopotamus*, and of the *Mastodon*, the last variety reaching its greatest size somewhat later. The tread of these mammals was almost enough to make the hills and valleys tremble. Trees were crushed in their pathway.[6] Job's description of the *Behemoth* may well be applied to this race of giant animals:

"Behold now behemoth; he eateth grass as an ox. He moveth his tail like a cedar. His bones are as strong pieces of brass; his bones are like bars of iron. Surely the mountains bring him forth food, where all the beasts of the field play. He lieth under the shady trees, in the covert of the reed, and fens. The shady trees cover him with their shadow; the willows of the brook compass him about. Behold, he drinketh up a river, and hasteth not: he trusteth that he can draw up Jordan into his mouth. He taketh it with his eyes: his nose pierceth through snares."

The suddenness of the appearance of this race of mammals both in Europe, where the uniformity of strata is clearly indicative of "a lost interval," and in the Rocky Mountain region of America, where the

interval between the *Cretaceous* and the *Tertiary* is far less marked, also the wide difference between this fauna and that found in the preceding era — perplexingly marvellous facts in any atheistic theory of evolution — allow us, as in the other instances, to accommodate the language of Moses to this epoch:

"And God said, Let the earth bring forth the living creature after his kind, cattle, and creeping thing, and beast of the earth after his kind: and it was so. And God made the beast of the earth after his kind, and cattle after their kind, and every thing that creepeth upon the earth after his kind: and God saw that it was good."

It may be remarked in this connection that up to the early part of the period under consideration, there is no evidence that man, either prophetic or Adamic, anywhere existed. As to the date of his origin, three sciences, History, Archæology, and Geology, must be allowed to co-operate in furnishing information. Canon Rawlinson has clearly shown the remarkable convergence of all reliable historic and archæologic dates, outside of the Bible, towards a time not earlier than three thousand, nor later than two thousand years B. C. Scripture history goes further, carrying us back to *antediluvian* man. Geological history has no firmly established data, though as to certain points there is quite general agreement. Says Le Conte: "The *Miocene* man is not acknowledged by a single *careful* geologist." Both M. Favre, reviewing the subject up to 1870, and Professor Evans, President of the Geological Society of London, thoroughly examining the subject in 1875, decided that the existence of *Tertiary* man was unproved. Careful examinations of later formations have been made throughout Europe, in the United States, and in some parts of India. As a result, we are told by an eminent authority, that "there is no reliable evidence yet of man's existence before or even during the true *Glacial* or ice-sheeted epoch." In the later *Terrace* period there are human remains. It is not clear, however, that they at all antedate the Asiatic descendants of Adam. Still, it need not be surprising, should it hereafter be established that there are remains of beings who in merely physical or physiological structure resemble existing man. The great law of geological or creative prophecy would almost seem to demand an order of animal life a little more clearly typical of the Adamic race than has yet been discovered.[7]

It should be noted still further, that the uncertainties of geological chronology have been of late not a little increased by certain discoveries of Dr. Wyville Thomson, Dr. Carpenter, and others, of creatures now living in the deep seas, which geologists, if they had found them as fossils, would unhesitatingly have ascribed to a very early epoch.

Professor Winchell, in *Sketches of Creation*, speaking of the antiquity of man, is emphatic. He says:

"There is more in the history of primeval man that confirms our Scriptures than there is of conflict with them. Man has no place till after the reign of ice. . . . But it has been imagined that the close of the reign of ice dates back perhaps a hundred thousand years. There is no evidence of this. The cone of drift materials accumulated at the mouth of the Tinière, in which have been found human remains, was estimated by Morlot to be from ninety-six to one hundred and forty-three thousand years old; but Dr. Andrews has exposed a curious arithmetical blunder, the correction of which reduces the time to within five thousand years. We have no rule for the measurement of post-tertiary time which necessitates the admission of so high antiquity to our race. If we have been accustomed to think of the extinction of the cave-bear as dating back to high antiquity, we now discover that he lived with man, and the reindeer, and other animals which still survive. The existence of even the cave-bear may not have been so very remote. What are the reasons assigned for the prevalent opinion that it was many ages ago that the glaciers began to disappear from Europe? Simply the existence at that time of quadrupeds now extinct, together with the presumption, unsupported, as it seems, by the facts, that no animals have coexisted with man except those of the recent fauna. The fact is, that we come ourselves upon the earth in time to witness the retreat of the glaciers. They still linger in the valleys of the Alps, and along the northern shores of Europe and Asia, while the disappearance of animals once contemporaries of man is still continuing. Not only did contemporaries of man become extinct during the age of stone; some survived to the twelfth, fourteenth, and sixteenth centuries, as already stated; the Moa of New Zealand, and the Æpiornis of Madagascar, have become extinct within the epoch of tradition, as indeed has the Mammoth of North America; the Dodo of Mauritius disappeared in the seventeenth century; the Great Auk of the arctic regions has not been seen for half a century; and every one must be convinced that the beaver, elk, panther, buffalo, and other quadrupeds of North America are approaching extinction by perceptible steps. The fact is, we are not so far out of the dust, and chaos, and barbarism of antiquity as we had supposed. The very beginnings of our race are still almost in sight. Geological events which, from the force of habit in considering geological events, we had imagined to be located far back in the history of things, are found to have transpired at our very doors. Our own race has witnessed the dissolution of those continental glaciers which we have

so long talked of as incidents of pre-Adamic history. Our own race has witnessed the submergence of Southern Europe; the detachment of the British Islands and Scandinavia from the continent; the wanderings of the great rivers of Eastern Asia; the submergence of thousands of square miles of the coast of China, so that the seats of ancient capitals are now rocky islets far at sea. The emergence of the ancient country of Lectonia; the drainage of the vast lake which once overspread the prairies of Illinois; the alternations of forests, and many other events which we once associated with high antiquity. It is the opinion of Hooker and Gray that the Falkland Islands, and others in the vicinity, have formed a part of the continent of South America during recent times, and that during this connection they acquired the continental fauna and flora. The Straits of Behring may even have been cut through since the early migrations of man and his contemporaries, the mammoth and reindeer; as in some distant future age the Isthmus of Darien, which now connects North and South America, may become a strait separating them. There is no more reason in this day than fifty years ago to claim a hundred thousand years for the past duration of our race." [8]

Returning to the characteristics of the *Cenozoic* day, and allowing its later periods to include the earlier part of the *Quaternary* era, we find it remarkable in many respects not yet mentioned. There were late in the day immense oscillations of the earth's surface, resulting in, or accompanied by, conditions that were extremely destructive. Northern Europe and Canada rose more than a thousand feet above their present level. The temperature fell greatly below its former average. The polar ice-sheet crept southward in North America until it covered Sierra Nevada, reaching even to southern California. The Yosemite Valley and the Lake Tahoe region were filled with glacial ice. Over the Middle and Eastern States this polar ice-sheet extended to the fortieth degree. The *Archæan* region of Canada was covered with an ice-mantle from three to six thousand feet thick. So likewise the British Isles, the whole of Scandinavia, Switzerland, and all northwestern Europe and Asia, were under fields of ice, which at the culmination of the *Glacial* period extended as far south as the fiftieth degree. Animals belonging to the northern latitudes perished or were forced to retreat southward. They entered all available caves and caverns. It was then, as is supposed by some scientists, that much of the cave bone-rubbish was accumulated. The picture drawn by Le Conte is doubtless true of what then took place. "Animals of all sizes and kinds," he says, "are supposed

to have huddled together in those caves, forgetting their mutual hostility in the sense of a common danger and perished miserably together there."

Later in the day came the *Champlain* period, during which the land surfaces sunk until the sea stood from five hundred to a thousand feet above its present level.[9] The climate moderated, the ice rapidly melted, and the waters of lakes and seas were filled with icebergs, which discharged their cargoes of gravel and boulders over lands widely separated.

These changes, though not in every instance sudden, were nevertheless attended with sweeping devastations and death. The world is not improperly represented during the close of this era as a vast and almost, though not quite, silent grave-yard. The most recent investigations show that some varieties of life seem to have struggled on into the later or established human period.[10]

The length of time thus far consumed is bewildering — in all, perhaps, a thousand million years. Such are the six work-days of the cosmical and prophetic week of creation. That there is general agreement among scientists, as to these six eras, there can be no question. Indeed, refer to any modern treatise upon geology, and the coincidence is at once noticeable. For illustration: We have in Professor Marsh's classification, first, the *Planetic* era; second, the *Archæic;* third, the *Paleozoic;* fourth, the *Mesozoic;* fifth, the *Cenozoic;* and sixth, the *Psychozoic.* In Le Conte's classification there are, first, the *Eozoic;* second, the age of *Invertebrates;* third, the age of *Fishes;* fourth, the age of *Acrogens;* fifth, the age of *Reptiles;* and sixth, the age of *Mammals.* The classification of Professor Dana, except the terms employed, is identical with the foregoing: First, *Azoic* age; second, age of *Mollusks;* third, age of *Fishes;* fourth, age of *Coal;* fifth, age of *Reptiles;* and sixth, age of *Mammals.* These six periods and the six days of Moses, it will be noticed, show a remarkable agreement.

Thus the case stands at the present stage of scientific investigation. What the next ten years may bring to light through geological researches, we do not know.[11]

Now bear in mind that it is this striking and wonderful correspond-

ence between the Bible account and modern science, which has led such Professors as Guyot, Hitchcock, Dana, and such men of science as Hugh Miller; Humboldt, and Chancellor Dawson, and such Biblical students as Professor Schaff, Lange, and President McCosh, to say that Moses either must have known the general facts of modern geological science, or else have been inspired to make the record in Genesis. And more than this, they think that Moses must have meant by the term "day," one of these six vast periods into which geological history is so manifestly divided. Indeed, were it not for the word "day," with its "evening and morning," and were it not for the opinions of eminent Hebrew scholars, without taking an additional step, we might be satisfied to rest the argument upon this unmistakable and remarkable agreement of Bible statements with the disclosures of modern science. But, as the case stands, we cannot, and therefore venture to take the additional step.

IV.

THE LAW OF TYPE AND ANTITYPE.

According to the theory as already outlined, it was after those vast cosmical periods had passed, after the *Champlain* submergence and the *Drift* ice-flow had wrecked the earth's surface, and just prior to the *Human* period, that the Creator, in six ordinary days, accomplished the work which is definitely recorded in the book of Genesis. The theory also involves the claim that these ordinary days were anticipated, or were typified by the six scientific, or cosmical days of the original creation.

There is certainly a strong antecedent probability in support of this view, in the fact that there is a prophetic or typical principle found everywhere in the universe. One dispensation as a forerunner of another, is a universal order or arrangement in the nature of things. Childhood is a prophecy, manhood its fulfilment. The Jewish theocracy was a type, Christianity the realization.

Or, confining attention to the field of pure physics, we shall discover that the fins of fishes, and the wings and the feet of birds, and the fore and hind feet of brutes, created before man, are typical or prophetic of the arms and feet of man. George Mivart makes the following statement of this subject:

"Thus man, the horse, the whale, and the bat, all have the pectoral limb, — whether it be the arm, or fore-leg, or paddle, or wing, — formed on essentially the same type, though the number and proportion of the parts may more or less differ. Again, the butterfly, and the shrimp, different as they are in appearance and mode of life, are yet constructed on the same common plan, of which they constitute divergent manifestations."

Man, as Professor Owen expresses the same thought, has had all his parts and organs "sketched out in anticipation in the inferior animals."

Says Professor Agassiz, speaking of animal types: "They appear now like a prophecy in those earlier times of an order of things not possible with the earlier combinations then prevailing in the animal kingdom, but exhibiting in a later period, in a striking manner, the antecedent consideration of every stage in the gradation of animals."

The lower forms of animal life are not therefore necessarily those from which later forms were *developed*, but apparently are those which *prophesied* the coming of those forms which God was to create when suitable conditions had been reached. Thus, likewise, prehistoric human remains, should they be discovered, might be those of irrational creatures, not from which rational man has been developed, but which are simply a type, in accordance with which God designed to make rational and existing man when the ordained period had arrived.

Professor Agassiz carries this general thought a step further, showing that types and prophecies are even found in minerals. He asserts that "the crystal imbedded in the rock, by the little fibres and threads that go out from it, anticipates the coming vegetable." "And vegetation," says Chancellor Haven, "when it reaches perfection pre-typifies the coming animal, and the animal in its instincts pre-typifies the coming reason of the man."

"The swan on still Mary's lake
Floats double, swan and shadow."

It is the discovery of the presence throughout physical nature of this typical or prophetic principle, sometimes termed the law of "springing and germinant accomplishment," which leads to an antecedent probability that there will be found for every type in the work or method of creation an antitype. Indeed, it should occasion great surprise, if upon thorough investigation it should be found that the Creative Power, in fitting the universe for habitation, has departed from this law of type and antitype, or of creative prophecy and fulfilment. Hence, if the Mosaic account of creation describes cosmical days, then the scientific mind ought confidently to look for a corresponding work embraced in six ordinary days. Or, if the Mosaic account describes

ordinary days, then we ought, upon strictly analogical and scientific grounds, just as confidently to expect a prophetic work embraced in six cosmical or geological periods. Prophecy and fulfilment in creation there ought to be, in which a thousand years are as one day, and one day as a thousand years.[12]

V.

CHAOS AND THE MOSAIC DAYS.

BEFORE advancing, it is well to observe that we do not claim that Moses was not permitted or inspired as well to see what transpired in the vast cosmical or primitive creative periods, as in the six solar days. He may or he may not have seen those early parallel developments. But if he saw both the type and the antitype, and if he wrote of both, then his whole account of the original creative periods, or the type, is included in the first verse of the first chapter of Genesis. For upon exegetical grounds, as already shown, we must insist that verses two and twenty-eight inclusive, of the first chapter, and verses one and three, and five and seven inclusive, of the second chapter, refer to six ordinary days, which had been typified by the earlier and undescribed cosmical days or periods.

In a word, as *Yom* (day), though sometimes used to denote an indefinite period, as in verse four, chapter second, is never so used when limited by the words, *a-yav* (evening), and *ba-kar* (morning), it follows, that in harmonizing the Mosaic account and modern science, we are, after passing from the first verse of chapter first, to limit attention primarily, and indeed exclusively, to six solar days; and we are to consider all the early and distinctive geological formations as merely evidences of parallel, or typical and prophetic epochs.

Hence, under the light of a very well-established exegesis, aided by various acknowledged data which certainly support our working hypothesis, we cannot fail of discerning that those remarkable words, "In the beginning God created the heavens and the earth," cover the entire past of the present administration of the physical universe. The starting-point of the period designated by Moses is not, therefore, limited, as is sometimes talked, to six thousand, nor sixty thousand, nor six hundred thousand years. The words employed merely tell us that the silence of

a section of eternity was broken, and that something appeared which at least, was not previously visible. The only restriction placed upon science at this point by the Mosaic account, is, that the evolution and development of the material universe, with which our world is connected, had a beginning under the direction of a power called God.[13]

In this connection, the mind of the reflective student is at once engaged with the thought, that the condition of darkness and emptiness which preceded the original creation of light upon the first cosmical or astronomical epoch, harmonizes with what must have been the condition of the earth after the true glacial, and during the turbulent drift period. During that epoch of melting ice and of floating icebergs, much of the earth now inhabited was under the sea. There were howling winds, and among the mountains there were grinding and crushing icebergs, and the sky was everywhere heavily inswathed with dense banks of vapor, fog, and clouds. Conditions similar to those which now produce the dense fogs of London, and the well-nigh perpetual fogs along the north-eastern coast of North America, existed round the entire earth, and nearly from one pole to the other. Thus, in this darkness, and in this wreck of the earth's surface, was a blank, as already intimated, that corresponded with the blank which science declares preceded the original creation of light.

Turning now to the Mosaic account, and following a strictly literal translation, we read these words: "In the beginning created God the heavens and the earth. Then the earth became a roaring flood and void, and darkness was upon the face of the billows."

Read, if you please, any scientific work upon the *Drift* period, whether from the pen of a believer in the Bible, or an unbeliever, it matters not, and the agreement between it and the Bible account will be found exact. That is, both science and the Bible affirm that after the earth had been created, after it had existed a countless number of ages, during which it had been governed by natural laws, much as it is now governed, after it had met with change and vicissitude, had laid up in storehouses the geological deposits of granite and clay, of coal and oil, of salt and lime, of silver and gold, then it became a waste. In the zone where man first appeared, scarcely a living thing moved on its surface, or burrowed in its soil.

VI.

MOSAIC DAYS: THE FIRST, SECOND, AND THIRD.

A MOMENT'S reflection at this point will convince any person that all the sciences unite in a declaration, that, in order to render the earth inhabitable, the ice-line must retreat north, and the thick mantling of vapors and fogs — a mantling so dense as to render day impossible and night perpetual — must lose somewhat of its density, so that the light could at least struggle through the darkness, enabling one, if upon the earth's surface, to distinguish day from night. This, we repeat, is what must first take place in order to render the earth inhabitable. No scientist would be disposed to or could dispute this statement. But how could such changes be brought about, must have been at that time a perplexing question. The Bible account answers the question thus: "Then the Spirit of God was brooding upon the face of the waters. Then said God, Light be; and light was. Then God saw the light that it was good; then God divided between the light and between the darkness. Then God called the light day, and the darkness he called night. Then was evening, then was morning; day one." Thus far, Bible statement and scientific fact perfectly harmonize.

This change to comparative daylight from a blackness denser than that of a Newfoundland midnight, could by Creative Power have been effected, it must be allowed, without doing any violence to modern science, in a day of twelve hours duration. Certain meteorological or electrical changes were all that was necessary.

The type of this day's work is found evidently in the primitive creative period, when the flames of nebulous gases flashed out from the original chaotic darkness.

The next change, according to science, which was necessary in order to render the earth inhabitable, was such as to clear up the banks of fogs

that still clung to its surface. They must be lifted to the higher regions of the sky through some agency — perhaps, by the introduction of new elements into the atmosphere — so that between the waters of the earth and the dense moistures which had been held in the atmosphere, there would be a breathing-space of pure and pellucid air, for upon this depended the possibility of thrifty and healthful vegetable and animal life. Something like this is witnessed in the breaking up after a storm. The fogs rise, concealing the sun, even after the atmosphere upon the earth's surface, as far as the eye can reach, is clear. But how, it may well be asked, could these very desirable and necessary changes be accomplished? The Bible account again answers: "Then said God, Let an expanse be in the midst of the waters; and let a dividing be between the waters to the waters. Then God formed the expanse, and divided between the water which was above the expanse and between the water which was beneath the expanse: and it was so. Then God called the expanse heaven. Then was evening, then was morning; day second."[14] These changes, upon strictly scientific grounds, required for their accomplishment no more than a single day of twelve hours duration. Thus again, Bible statement and scientific fact are found to be in such exact agreement, that no man caring for his reputation would venture to divorce them. Furthermore, the cosmical type, of which this second ordinary day is the antitype, is manifestly found in that early epoch before organic life and dry land had appeared, and when by slow processes the atmosphere was elaborated from the primeval waters and vapors.

Thus far, upon scientific grounds, we have shown, what, from the nature of the case, must have been the process and order of the earth's renewal. From this point onward we can follow definitely the geologic records. That is, we know that the world was deluged during the *Drift* period. North America was two or three thousand feet under water. In a similar condition were all countries which have been geologically examined. Therefore, before there can be further advance in preparing the earth for habitation, the waters which still concealed its surface must by some agency be removed.

There are two ways which at that time were scientifically possible: First, a change in the atmosphere, which, without destroying its trans-

parency, would render it a greater absorbent of water; and second, some change in the ocean of waters which would enable them to undergo greater condensation. By either method, or by both combined, the required changes could be easily, quietly, and quickly accomplished, and the words of the Psalmist would be accurately descriptive:

"Thou coveredst it with the deep as with a garment: the waters stood above the mountains. At thy rebuke they fled; at the voice of thy thunder they hasted away. They go up by the mountains; they go down by the valleys unto the place which thou hast founded for them. Thou hast set a bound that they may not pass over; that they turn not again to cover the earth." [15]

These surface changes of the earth described by Moses, it will be noticed, find their type or prophecy in that cosmical epoch when a world of rocky peaks, active volcanoes, lava currents, vast mud flats, with nowhere "a blade of grass or a clinging lichen," were upheaved from their watery sepulchre.

Upon this second solar day, after the retiring of the waters, the earth was in readiness for an order of vegetation hitherto unknown. But whence could it come? Various agencies had been at work to devastate the flora of the old geological periods. The *Glacial* and *Drift* eras, for instance, had made with it sad havoc. Were the conditions which characterize the *Glacial* and *Drift* eras reproduced in our day, we do not see how any existing flora could survive. Aside from those atmospheric changes there had also been geographical elevations and subsidences, which are thought to have been of sufficient magnitude to wreck every remaining plant and tree which had flourished during the geological ages. Says Dr. Lardner:

"The disruption of the earth's crust, extending W. 16° S., and E. 16° N., through which the chain of the great Alps was forced up to its present elevation, which, according to M. D'Orbigny, was simultaneous with that which forced up the Chilian Andes, — a chain which extends over a length of three thousand miles of the western continent, — terminated the *Tertiary* age, and preceded immediately the creation of the human race and its concomitant tribes. The waters of the seas and oceans, lifted up from their beds by this immense perturbation, swept over the continents with irresistible force, destroying instantaneously the entire flora and fauna of the last *Tertiary* period, and burying its ruins in the sedimentary deposits which ensued." [16]

Whence, therefore, could come the existing grasses, plants, and trees? They differ, as a matter of fact, from those that had previously existed. Furthermore, that early vegetation, as just hinted, appears to have been largely devastated. Since the *Drift* period there does not seem to have been time sufficient, by the processes of development, to produce the existing flora, and there is as yet no positive evidence that decidedly distinct and established species have ever been developed from previously existing species.[17] Whence, then, we repeat, came the grasses, and the herbs, and the fruit-bearing trees belonging to the present *Human* period? From some source they must have come. There could have been no oak without an acorn; there could have been no acorn without an oak. Whence the first oak, or the first acorn, for the modern oak and acorn are not found the other side of the *Drift* epoch? Whence did they come, and what power was it that fitted the deluged earth for their reception, are legitimate questions. Again, the Bible account answers the perplexing inquiries:

"Then said God, Gathered be the waters from under the skies into one place, and let the ground appear: and it was so. Then God called the ground land, and the gathered waters he called seas; then God saw it was good. Then said God, Grow the land grass, herb yielding seed, fruit tree bearing fruit after its kind in which is its seed, upon the land: and it was so. Then brought the land forth grass, herb yielding seed after its kind, and tree bearing fruit, in which was its seed after its kind: then was evening, then was morning; day third." And a day having a morning and an evening of twelve hours duration, was all that was needed.

The type of which this Mosaic day is the antitype is found in the *Carboniferous* period, when the lower forms of vegetation flourished as never before nor since.

VII.

MOSAIC DAYS: THE FOURTH, FIFTH, AND SIXTH.

Fixing attention again upon the Mosaic account of the world's evolution and preparation, we ask, what, from the nature of the case, must have been done next, in order to grow this created vegetation, and fit the earth for animal life? Upon a cloudy day the plants and trees were created; but without the clear sunlight of after-days they would sicken and die. Hence, it was necessary that the clouds which had hitherto concealed the sun and stars, should be removed. There had been, since the beginning of the *Drift* period, daylight, but no direct sunlight. The sun, moon, and stars must therefore next appear, and the years likewise, and seasons as now ordained, must commence, before vegetable and animal life, as they now exist, could thrive.

In perfect keeping with these scientific requirements, as any one can see, is the Mosaic account:

"Then said God, Lights be in the expanse of the heavens to divide between the day and between the night; and let them be for signs, and for seasons, and for days, and years. And let them be for lights in the expanse of the heavens, to shine upon the earth: and it was so. Then God displayed the two great lights, the greater light to rule the day, the little light to rule the night, and the stars. Then God displayed them in the expanse of the heavens, to shine upon the earth. And to rule over the day and over the night, and to divide between the light and between the darkness: then God saw that it was good. Then was evening, then was morning; day fourth." [18]

The evening came, the sun set clear for the first time since the *Drift* period had clouded the earth, and an ordinary night of twelve hours,

spangled with stars, stars which, perhaps, had been clouded for thousands of ages, rested upon the renewed and peaceful world.

The type or the prophecy of this fourth Mosaic or solar day is found in the clearing up of the dense atmosphere which succeeded the *Carboniferous* period, a clearing up extending through millions of ordinary days and nights.

Returning to the Bible record, we observe that these four Mosaic days had witnessed wonderful changes. The darkness had given place to light; the atmosphere had expanded; the waters had receded; the vegetable productions had appeared; the sun had shone forth, and everything was in readiness for further divine unfoldings. In a word, the forest solitudes, and the grassy hillsides, and the water-brooks, and the rivers, the lakes, and the seas, were waiting to welcome the coming of their ordained tenants. Ah! but how did they come, or how could they come? Whence these primitive immigrants? There could have been no hen without an egg, and there could have been no egg without a hen; whence the first hen, or the first egg? The Mosaic account responds thus:

"Then said God, Let the waters swarm with animal life, and let birds fly above the earth, upon the face of the expanse of the skies. Then God created the great fishes, and every living, breathing thing that creepeth, with which the waters abounded, after their kind, and every bird of wing after its kind; then God saw that it was good. Then God blessed them, saying, Be fruitful and multiply, and fill the waters in the seas, and let the fowl multiply in the land. Then was evening, then was morning; day fifth."

Great is this creative might and majesty. Between sun and sun of a single day, the waters and the atmosphere received their modern inhabitants, at a word of command. The creations of this fifth day are the antitype of which the earlier reptilian monsters of the geological ages were the type and prophecy.

From this point the Bible record moves on in sublime and triumphant grandeur. At the dawn of the sixth Mosaic day we read:

"Then said God, Let the land bring forth the living breather after its kind, cattle, and creeper, and beast of the land after its kind: and it

was so. Then God made the beast of the land after its kind, and the cattle after their kind, and every creeper of the soil after its kind: then God saw it was good."

And then, last of all, and at the head of all, — after all else was fully prepared; after the vast cosmical eras had performed their part; after the granite had been formed and piled up in lofty mountain-ranges; after the flowing and returning waters had selected and borne down into distant vales the vegetable soils; after electric shocks had interlaced the earth with metallic veins; after the ancient forests had hardened into coal, and were stored up by the cubic mile, having yielded also their reservoirs of petroleum; after the deposits of primeval waters had become iron and crystal salt; after successive races of animals had become a multitude of useful material; after reptiles had cleared the waters of impurities and the land of rubbish; after birds had devoured the animal remains and enriched the soil; and after the appearance and disappearance of the monster mammals of the geological epochs, which were the type and prophecy of the animals of the sixth Mosaic day; after the great floods had been rolled back, and the dome overhead had been lighted up, and the earth's surface had been carpeted with delicate and soft green; after the rich profusion of natural scenery had been prepared; the flowers filled with fragrance, the trees hung with delicious fruit; — then "created God the man in his own image, in the image of God created he him; male and female created he them. Then was evening, then was morning; day sixth."

And how can unprejudiced scientists well do otherwise than bow their heads in acknowledgment, saying, "Lastly, God, or Something not ourselves, infinite in wisdom, power, and majesty, whose work is *miraculous*, *prophetic*, and *orderly*, created man in his own image"? But there are those, a few only, who speak otherwise. They search for a different solution of the human problem, and hypothesize, saying, "Lastly, man was evolved; he was evolved male and female, and was developed from lower orders through processes of natural selection, and under the law of the survival of the fittest."

VIII.

THE SEVENTH DAY.

BEFORE attempting to search for a harmony between Revelation and Science as to the origin of life, we review certain discussions bearing upon the Seventh day.

Both those who advocate the long periods, and those who maintain the solar-day theory of creation, claim that the Mosaic account of the seventh day establishes their peculiar views. As God is now resting, and has been doing so for the past six thousand years, and as the seventh day was like the other six days, therefore, as is claimed, the other six days were not solar, but of indefinite duration. On the other hand, it is argued, that the context shows that Moses, when speaking of the Sabbath, had in mind, not an epoch of indefinite length, but an ordinary solar day; therefore, as all the seven days are alike, the six days must be, not of indefinite length, but ordinary solar days. Thus one party apparently has as good ground for its argument as the other.

A careful analysis of the subject will show, however, that the Mosaic account of the Sabbath ought not by either party to be too much involved nor depended upon, in connection with the question of the length of the creative days. That account, in fact, cannot be adduced exclusively in support of either side of the discussion.

To make this statement clear, attention is called, *first*, to the exegesis of the passages referring to the Sabbath, and *second*, to certain related scientific facts. An exact translation of the second chapter of Genesis, first and third verses inclusive, is the following:

"Then were finished the heavens and the earth, and all the host of them. Then finished God on the seventh day his work which he had made; and rested on the seventh day from all his work which he had made. Then blessed God the seventh day, and hallowed it;

because in it he had rested from all his work, which created had God to make."

With this should be connected Exodus xx. 8–11.

"Remember the sabbath-day, to keep it holy. Six days shalt thou labor, and do all thy work: but the seventh day is the sabbath of the Lord thy God: in it thou shalt not do any work, thou, nor thy son, nor thy daughter, thy man-servant, nor thy maid-servant, nor thy cattle, nor thy stranger that is within thy gates. For in six days the Lord made heaven and earth, the sea, and all that in them is, and rested the seventh day: wherefore the Lord blessed the sabbath-day and hallowed it." Compare also Exodus xvi. 22–27.

The reader will notice that in certain respects the seventh day in the Mosaic record is clearly distinguished from the other six days. The narrative, for instance, is occupied, in the case of the six days, with the work accomplished in each, but on the other hand, the seventh day is itself the subject of the narration. Each of the six work-days closes with a specific formula, — "morning and evening." We therefore naturally look for the expression, "and the evening and the morning were the seventh day," but such is not the record. The conviction will, therefore, fasten itself upon any one believing in the inspiration of the Bible, that there must be some adequate reason for this remarkable omission of what had been so regularly repeated at the close of all the preceding days or epochs.

Before giving an explanation of this omission, we call attention to the words, "And on the seventh day God ended his work which he had made," and to the fact that geology presents no evidence of the production of any new species of plant or animal since the creation of man. "It is the report of all sciences bearing upon this subject, that thousands of years have swept by since God ended his work of creation, without witnessing a new order of being. Works of necessity — works of providence and mercy — he still carries on. 'My Father worketh hitherto, and I work.'" But creation is not a work of necessity. That work he ended at the close of the far-off sixth day, and ever since has rested. This rest is not in consequence of the fact that God is tired, but only because his creative designs under the present dispensation are completed.

In a word, the facts, according to the record, appear to be these: After the six long geological periods had passed, and after the six solar days of the Mosaic record were brought to a close, then the Eternal One, *first*, ceased from his work, and *second*, he rested. That is, he rested during the hours of the solar day following the six preceding solar days.

Of the long period, including the time from that first solar Sabbath to the present, Moses does not speak definitely, though the absence of the formula, "evening and morning," may lead us to infer that each recurring Sabbath-day is a *moving type* of which the last six thousand years are the *standing antitype*. The solar Sabbath, the type, has its recurring dawn and twilight; it comes and goes. But the divine Sabbatical epoch continues without its recurring dawn and twilight. The solar or Mosaic Sabbath is a weekly prophecy of the Sabbath epoch in which we now live, but whose morning has hardly yet dawned. In the words of a thoughtful writer:

"We are still in the Sabbath eve, unless Christ's ascension were its terminating era. But what that Sabbath morning may be, we must learn from the Scriptures or never know at all. The Bible speaks of 'the morning of the resurrection.' Is it a mere figure, or something more than a figure, — a reality transcending in literal and substantial glory any of the matutinal periods of the earth's early physical formation? There is the 'morning when the upright shall have the dominion,' which dominion may be on this very planet. Or if this is thought to have too much difficulty attending it, there is also that morning of the latter-day glory whose auroral effulgence is so vividly pictured by the rapt Hebrew seers, — that glorious morning when 'Zion shall have put on her beautiful garments,' her spotless Sabbath robes, — when the Church for which the earth was made, 'shall rise and shine, *for her Light has come* and the glory of her Lord has risen upon her,' — when nations shall go by her *light* and kings by the splendor of her rising,' — when her risen 'sun shall never more go down, for the Lord shall be her everlasting light and her God her glory.' Instead of mediate or reflexive illumination through the heavenly bodies,

'The Light Himself shall shine
Revealed, — and God's Eternal Day be thine.'"

IX.

ORIGIN OF LIGHT AND LIFE, AND CREATION OF MAN.

THOUGH it could be proved beyond question that the order of the creation and development of the physical universe as recorded by Moses is identical with that discovered by modern science, still the fundamental question as to the efficient cause of that creation and development would remain unsettled. The theist of whatever school would continue to affirm that God is the ultimate cause of all things, while the atheist would just as resolutely affirm that natural forces have created and developed all things, and that there is no God except natural forces. Hence, the fiercest conflicts between belief and unbelief, in the future as in the past, will be waged about questions relating to the origin of matter and life, including the life of vegetation, that of brute creations, and of man.

As to the origin of matter, the Mosaic account is silent. The general opinion concerning the material substances comprising the present physical system, is, that they are destitute of the properties of necessary existence, and therefore are not eternal. That is, we can conceive of matter in its present forms, also in any form, as not existing; but, on the other hand, we cannot conceive of duration of space and of mathematical axioms as not existing. It is, therefore, generally felt that matter is not a necessary existence, like duration, space, &c., and must have had a beginning, not from chance, or by some blind law of development, but through infinite power and intelligence.

Such, we repeat, are the views generally held; still, it must be borne in mind that apparently the origin of matter is not discussed in the Mosaic record, hence we do not feel called upon in this treatise to defend or to combat any existing theory as to the beginning of matter.

In the first verse of the first chapter of Genesis, the word translated "created" is *bara*, whose primary meaning is to *cut*, hence to *shave*, *shape*, *form*, or *fashion*. So, also, the German word *schaffen*, by which Luther translates *bara*, being of the same root with *schaben* (Belgic *schaeven*), which means to *shave*, *cut*, hence to make or fabricate out of existing materials. It is this idea of *making*, which consists in cuttings, separations, and arrangements by division of what previously exists, instead of the production of something from nothing, which Moses seems to have had in mind.[19]

Passing, therefore, from the question of the origin of matter, we find that the Mosaic record reveals the fact that there was a time when, within the limits of the present physical universe, light was not, and a time when life was not. And between the theist and the atheist, as to this fact, there is and there can be no ground of controversy. The primeval absence of light and life is now a universal admission. But the cause of light and the cause of life is the ground for a conflict of opinions. The atheist says their production was spontaneous. The theist of christian faith, on the other hand, accepts the statements of the Mosaic record that it was God who called light and life into being.

That this Bible record may be better compared with the developments of modern science, we reproduce the vital points revealed, using the language of an exact translation, selecting from both the full account in the first, and from the abridged and corresponding account in the second chapter of Genesis:

"And the earth had become a waste and a void, and darkness was upon the face of the deep." Chapter I., verse 2. "Then said God, Let there be light; and there was light." Verse 3. "And not a plant of the field was yet in the land, and not an herb of the field yet grew." Chapter II., verse 4. "Then said God, Grow let the land grass, herb yielding seed, fruit tree bearing fruit after its kind, in which is its seed, upon the land: and it was so." Chapter I., verse 11. "Then said God, Let the waters abound with the crawler that hath breath and life, and let the fowl fly above the earth, upon the face of the expanse of the skies. Then created God the great fishes, and every living breathing thing that creepeth with which the waters abound after their kind and every bird of wing after its kind." "Then said God, Let the land bring forth the living breathing thing after its kind, cattle and creeper, and

beast of the land after its kind: and it was so." Verses 20, 21, 24. "And there was no man to till the ground." Chapter II., verse 5. "Then said God, Let us make man in our image after our likeness." Chapter I., verse 26. "And the Lord God formed the man of the dust from the soil, and breathed into his nostrils the breath of life; and man became a living soul." Chapter II., verse 7. "And the Lord God planted a garden in Eden to the East; and put there the man whom he had formed." Verse 8. "And the Lord God said, It is not good that man should be alone; I will make a helpmeet for him." Verse 18. "And the Lord God caused a deep sleep to fall upon the man, and he slept; and he took one of his ribs and closed up the flesh instead thereof. And the Lord God builded the rib which he had taken from the man into a woman and brought her unto the man." Verses 21, 22.

Such, in brief, is the Mosaic account of the shaping of matter, the origin of light and of life, and the creation of man. Whatever may be the future scientific grounds of objection, we hazard nothing in saying that up to the present date there is not one established scientific fact that discredits in the least this Bible record. That darkness was before light, no one questions. That there must have been some agency in the production of light is admitted. There could have been no effect without an *adequate* cause, and a cause adequate enough to fill with fire-light the space now occupied by the physical universe, must have been *Infinite*. It is not the slightest relief for the atheist to say that materials were so arranged that light was spontaneous. In spontaneous combustion, for instance, when substances take fire of themselves by the evolution of heat through the chemical action of their own elements, there are first needed, both the combustible substances, and the necessary arrangements and conditions. Thus, also, there must have been the previous creation of light-producing substances, and there must have been the required arrangements and conditions before the primitive light of the universe, through spontaneous combustion, could appear. Hence, if original light was not the immediate product of an invisible, potent, and intelligent agency, it must have been the spontaneous product of materials and arrangements that had been controlled by some invisible, potent, and intelligent agency. The fundamental scientific and philosophical postulates that "something can never come from nothing," and that "more can never come from less," and that "nothing can be evolved that has not been previously involved," and that the force in "the coiled spring can-

not more than equal the force that originally coiled it," proves the existence of an original, invisible, potent, and intelligent Agent or Agency the moment that light took the place of darkness. Therefore the words of the Eternal, "Let light be: and light was," can never be condemned as unscientific.

From light to life is, historically and logically, a natural transition. The simple point is this: Life now exists upon the earth; it has not always thus existed. Whence did it come? The Bible has given an account of the beginning of the life of vegetation, of brute creations, and of man. Can modern science give a better solution of the problem of life, or present any reason why the Biblical account should not be accepted? That scientific men of the materialistic school have been making the most determined efforts to account for life independent of a Supernatural presence, is well known to all our readers. How well have they succeeded is at the present hour an interesting inquiry.

Professor Huxley and others have often stated that if there were a few germs to start with, then from these, by processes of development through natural selection, a man even could be evolved. For from the lowest germs, as is claimed, there could be developed, first, moss and worms, and then from these could be evolved higher animals, and lastly man. Now, admitting all the might and majesty of natural selection that is claimed for it, we are not much better off until the moss and worms, or germs, are furnished.

A few years ago, in the Glasgow meeting of the British Association, Sir William Thomson presented the working hypothesis, that certain meteoric fragments, in time past, brought to this world from other planets the seeds and germs of all things now existing. At the outset it should be observed, that this speculation, in the light of astronomical, mechanical, and chemical science, can never be established, because white-heat, resulting from the passage of any foreign body through our atmosphere, would be destructive of all seeds and germs of life. But suppose this theory of Sir William were true, still the perplexing question remains: How came the germs and seeds, the moss and worms, upon that remarkable planetary fragment? Here is at most but a temporary postponement of the difficulty. Back of these shattered planets

are still other planets, as we may suppose. But after passing an indefinite series, we must at length come to a dead-lock, standing face to face with — *what?*

Or, without going beyond the surface of our own planet, we may admit, for the sake of the argument, that the materialistic theories respecting protoplasm, bioplasm, and the like, shall at length be established, and that it will some day be shown that from this "matter of life" has sprung the lichen, the cedar, the bird, the animal, and man. There is no likelihood that these theories will or can be established; but suppose they can be, does it therefore follow that protoplasm is ultimate?[21] Is there no query or curiosity a step further back? Rather, when protoplasm is reached, scientific inquiries have only commenced. Tyndall, Huxley, Bain, Drysdale, and Spencer admit that the action of bioplasts cannot be explained, as yet, by merely chemical properties or forces. What, then, does explain their action? Should we admit the development and protoplastic theories of materialism, still the atheistic difficulties are not removed. For upon scientific grounds it is discovered that every step of this wonderful journey, from moss and worms to man, bears the stamp, not of chance, but of design. Who, therefore, the designer? For chance is not a designer. As Laplace says: "We have thereby succeeded merely in throwing final causes one step further back."

How the difficulties confront us! To repeat expressions already used, there can be no woman without a child; there can be no child without a woman; whence the first child or the first woman? There can be no oak without an acorn; there can be no acorn without an oak; whence the first oak or the first acorn? There can be no living bioplasm without previously existing bioplasm; and there can be no previously existing bioplasm without — previously existing bioplasm. But whence that previously existing bioplasm? The chemist can just as easily make a world as he can give life to a bit of bioplasm.

Häckel says, "The history of the germ is an epitome of that of the race." But the life and existence of the germ are as unaccountable as those of the race. The theory of the spontaneity of life is in every way unsatisfactory. The closing words of Professor Tyndall's recent

lecture on the Origin of Life, before the Royal Institution at London, leave no chance for misunderstanding. He said:

"This discourse is but a summing up of eight months of incessant labor. From the beginning to the end of the inquiry there is not, as you have seen, a shadow of evidence in favor of spontaneous generation. There is, on the contrary, overwhelming evidence against it; but do not carry away with you the notion sometimes erroneously ascribed to me, that I deem spontaneous generation 'impossible,' or that I wish to limit the power of matter in relation to life. My views on this subject ought to be well known. But possibility is one thing and proof is another; and when in our day I seek for experimental evidence of the transformation of the non-living into the living, I am led inexorably to the conclusion that no such evidence exists, and that in the lowest as in the highest of organized creatures, the method of nature is that life shall be the issue of antecedent life."

The materialist sometimes calls this which is anterior to his discoveries, "a mystery," which we have no right to examine. We ask questions and are peremptorily told to stop. Now we insist that we have a right to examine and a right to question. Indeed, it is cowardly not to examine and to question. Sir William Thomson, in his triumphant indorsement of this protoplastic theory, exclaims: "Now that we have settled these vexed questions about the origin of life, let us go about our business." Settled! Go about our business! We cannot. These vexed questions are not settled. We must know, first, whence came this wonderful life-stuff, and, second, by what skill it has been arranged.

Nearly thirty years ago, Professor Taylor Lewis, discussing the origin of life, used this language: "But how, and whence, came life itself? Whence the primal force from which came forth all these manifestations of outward growth or development. The untaught Esquimaux stand on an equal footing here with La Marck, or Laplace, or Auguste Compte. Without light coming from above the plane of physical causation, one is just as ignorant as the other." Thirty years have made but little change in scientific opinion as to this subject.

Professor Tyndall quotes with approval the following words of Dubois Reymond: "It is absolutely and forever inconceivable that a number of carbon, hydrogen, nitrogen, and oxygen atoms should be otherwise than indifferent as to their own position and motion, past, present, or future."

It is remarkable that Professor G. F. Barker, in his address upon *Some Modern Aspects of the Life Question*, delivered before the late session of the American Association for the Advancement of Science, held in Boston, confesses that science, after the most rigorous investigations of the last forty years, is as much in the dark as ever. Still, the Professor does not despair; he hopes that in the future the problem may be solved upon natural grounds. He quotes the saying of Haughton: "The number of roots in our equation of life increases the difficulty of solving it, but by no means permits the acceptance of the lazy assumption that it is altogether insoluble, or reduces a sagacious guess to the level of the prophecy of a quack." "While the answer is not yet," continues Professor Barker, "a thousand earnest seekers after truth seem to be slowly approaching a solution. And though the *ignis fatuus* of life still dances over the bogs of our misty knowledge, yet its true character cannot finally elude our investigation. The progress already made has hemmed it in on every side; and the province within which exclusively vital acts are now performed narrows with each year of scientific research."

The Professor then shows, first, that life has a physical basis. He shows that all muscular motion is electrical, and then proceeds in his specification, employing this language:

"Time would fail me to discuss the many other phenomena of the living body which have been found on investigation to be non-vital. Digestion, which Prout said it was impossible to believe was chemical, is now known to take place as well without the body as within it, and to result from non-vital ferments. Absorption is osmotic, and its selective power resides in the structure of the membrane and the diffusibility of the solution. Respiration is a purely chemical function. Oxyhæmoglobin is formed wherever hæmoglobin and oxygen come in contact, and the carbon dioxide of the serum exchanges with the oxygen of the air according to the law of gaseous diffusion. Circulation is the result of muscular effort both in the heart and the capillaries, and the flow which takes place is a simple hydraulic operation. Even coagulation, so tenaciously regarded as a vital process, has been shown to be purely chemical, whether we adopt the hypothesis of Schmidt, that it results from the union of two proteids, fibrinogen and fibrinoplastic substance, or the latter theory of Hammarsten that fibrin is produced from fibrinogen by the action of a special ferment.

"One function yet remains which cannot be altogether omitted from our consideration. This function is that of the nervous system. In structure, this system is

well known to us all. In composition, it is made up essentially of a single substance, discovered by Liebreich and called protagon, the specific characters of which have lately been confirmed by Gamgee. In function, the nerve-cell and the nerve-fibre are occupied solely in the reception and the transmission of energy, which is in all probability electrical. There is evidently a close analogy between the nerve and the muscle, the axis cylinder, like the fibrilla, being composed of cells, and having a positive electric charge upon the exterior surface, which has a tension of one-tenth of a volt. Haughton attributes *tinnitus aurium* to the discharge of nerve-cells.

"The higher functions of the nerve-cell, those connected with mental processes, is a field too vast to be entered at this time. The double telegraph line of nerve, motor and sensor, in their effect, but as Vulpian has proved, precisely alike in function, are the avenues of ingress and egress. Every sensory impression is received by the *thalami optici;* every motor stimulus is sent out from the *corpora striata.* In the acts denominated reflex, the action goes from the spinal cord, and is automatic and unconscious. Should the impression ascend higher to the sensory ganglia, the action is now conscious, though none the less automatic. Finally, should deliberation be required before acting, the message is sent to the hemispheres by the sensory ganglia, and will operates to produce the act. Based on principles which can be established by investigation, a true psychology is coming into being, developed by Bain, Maudsley, Spencer, and others. A physiological classification of mental operations is being formed which uses the terms of metaphysical psychology, but in a more clearly defined sense. Emotion, in this new science, is the sensibility of the vesicular neurin to ideas; memory, the registration of stimuli by nutrition. Reflection is the reflex action of the cells in their relation to cerebral ganglia. Attention is the arrest of the transformation of energy for a moment. Ratiocination is the balancing of one energy against another. Will is the reaction of impressions outward. And so on through the list."

It will be noticed that Professor Barker's aim is to show that all the manifestations of life, physical and mental, are made up of protoplasm and electricity. The conclusion reached is the following:

"When, therefore, the chemist shall succeed in producing a mass constitutionally identical with protoplasmic albumen, there is every reason to expect that it will exhibit all the phenomena which characterize its life; and this equally whether protoplasm be a single substance or a mixture of several closely allied substances." [22]

The identity of vegetable and animal life is next established by the Professor:

"If this view be correct, it would follow that every individual substance found in the animal — save only those which result from degradation — must be found in the plant upon which it feeds; and this is the fact. The evidence then would seem con-

clusive that, since the protoplasm of the animal and vegetable kingdoms is identical, the former in all cases being derived from the latter, the animal as such neither produces nor vitalizes any protoplasm. Two inferences seem naturally to follow from this conclusion: First, that all the properties of animal protoplasm and of the animal organism of which it constitutes the essential part must have previous existence in the plant; second, that hence the solution of the life question in the myxomycetes will solve the life problem for the highest vertebrate." [23]

Thus having shown that all life, vegetable and animal, is a union of protoplasmic albumen and electricity, Professor Barker might have paused, as have many of his predecessors, and have refused to listen to the next question, namely: Whence this protoplasmic albumen and electricity, or rather, whence that which energizes the albumen and the electricity? But he is too fair and scientific to hesitate before that question, and therefore propounds the ingenious hypothesis that the source of all life and energy is in "the ether of space." His language will bear careful study:

"Now, as Preston has suggested, if we regard this ether as a gas, defined by the kinetic theory that its molecules move in straight lines, but with an enormous length of free path, it is obvious that this ether may be clearly conceived of as the source of all the motions of ordinary matter. It is an enormous storehouse of energy, which is continually passing to and from ordinary matter, precisely as we know it to do in the case of radiant transmission. Before so simple a conception as this, both potential energy and action at a distance are easily given up. All energy is kinetic energy, the energy of motion. In a narrower sense, the energy of matter-motion is ordinary kinetic energy; the energy of ether-motion, which may become matter-moton, fills the conception of the older potential energy. Giving now to the ether its storehouse of tremendous power, and giving to it the ability to transfer this power to ordinary matter upon opportunity, and we have an environment compared with which the strongest steel is but the breath of the summer air. In presence of such an energy it is that we live and move. In the midst of such tremendous power do we act. Is it a wonder that out of such a reservoir the power by which we live should irresistibly rush into the organism and appear as the transmuted energy which we recognize in the phenomena of life? Truly, as Spinoza has put it, 'Man thinks himself most free when he is most a slave.'"

We could hardly be justified in quoting so freely from Professor Barker's address, except that from a scientific point of view it is a remarkable production, and also that it is the latest able discussion of

the problem of the origin of life. But while acknowledging the ability displayed in the discussion, we have to express the regret that the Professor has not brought us one step nearer the solution of the problem of life than we were before listening to him. We are no better off with this ether-space theory than with the meteoric theory of Thomson. For admitting that all energy and life come from the ether-space, we are still left to inquire what or who treasured this world's energy and life in the ether-space? We would certainly thank the British Association or the American Association to tell us. Meantime, all these other questions are comparatively but the prattle of children.

There is a phase of the Mosaic account, however, which, in the light of a moderate materialism, deserves a passing notice. While the Bible clearly teaches that life ultimately came from an invisible, intelligent, potent, infinite, and personal Intelligence, it does not teach that each original plant, and each original animal, or each original species of plants, and each original species of animal, were the immediate creation of that Great Potent Agency which the Christian calls God.[24] The possible meaning of certain expressions in Genesis is, that at least some of the animals were the product of mediate creation, as was likewise all the world's flora. "And God said, Let the earth bring forth grass," &c. "And the earth brought forth," &c. There are two matters here involved: *first*, the creative word; *second*, a producing energy imparted, apparently, to the earth. Whether God at the instant of his command endowed the earth with inherent power to generate plants, or simply bade the plants he formed to take root, and grow from the earth, cannot be determined from the Hebrew text.[25] The text allows of either interpretation.

Thus, likewise, mediate rather than immediate creation, according to the Bible, may be predicated of the inferior animal life of the seas and of the land, as well as of the plant life of the earth. The English translation conveys this idea: "And God said, Let the waters bring forth (swarm or abound) abundantly the moving creature that hath life." This refers to the fish and reptile races, and to the birds, which are connected in the Bible and in science with the lower forms of animal life, in a manner that would appear to imply some community or similarity of

origin. "The prolific waters were the natural bed in which, through the vivifying agency of the Ruah Elohim, or Divine Spirit, originated the first 'moving things.'"

Not all animals were thus produced. The record says, "God *created* the great *taninim*,"— rendered the "great whales,"— a general name for the leviathan class of animals. In respect to this, however, there may be various tenable suppositions. "It may mean," as has been well said, "that some of those huge creatures, now extinct, and whose relics so much astonish us, were special formations, like man in a subsequent period, — so specially formed, perhaps, because like him they were intended, in their period, to hold an analogous though much inferior species of dominion over the other vegetable and animal tribes. It may denote that this production out of the earth and waters was confined to the fish and reptiles, and lower classes of aquatic birds, whilst the higher terrestrial animals were direct formations."

But some of the land fauna, according to the Mosaic record, belong as much to the mediate order of creation as does the earth's flora and the lower water animals. The text is as explicit in the one case as in the other: "Let the earth bring forth the living creature after his kind." This refers to quadrupeds and land animals generally.

Hence, if the naturalist says that originally the plants sprang from the protoplasm of the soil, and fishes and reptiles from the protoplasm of the waters and mud, and the smaller land animals from the protoplasm of the land, the Bible student should not hastily raise objections. For this idea of mediate creation through the agency of *created* protoplasm may be exactly what Moses means when saying, "And God said, Let the earth bring forth grass," &c.; and, "Let the waters bring forth abundantly the moving creature," &c.; and, "Let the earth bring forth the living creature after its kind," &c. The Christian student should insist, however, that there was a time when all life, vegetable and animal, was not, and then a time when it was; and that it never would have been, unless an Invisible and Potent Agency had commanded it into immediate existence, or had energized or protoplasized the waters and the land so that through them and by them, as media, life could appear.

The creation of man, according to the Mosaic account, materially

differs in certain respects from the creation of vegetable life and the life of brute creations. Vegetable and brute creations, for instance, are spoken of generically as species and races, with no reference to individual progenitors. But according to the Mosaic account, God made not a race of men, but a man, and then a woman. And the remarkable expression, "in his own image," which certainly has wonderful depth of meaning, makes a clear and ineffaceable distinction between the human race and other orders of the animal kingdom.[26] As has often been urged, the word *Adam* might allow that the account is generic and not individual, but the context utterly precludes such interpretation. In the words of an eminent writer and scholar:

"The particulars which are given respecting the female, her origin and established relation to the man, stamp upon the narrative a character of individuality which is unmistakable. The entire departure here from the language used in respect to other races puts the meaning beyond all doubt. If any fact in creation is clearly revealed, if there is any one placed beyond all cavil, beyond all room for any honest difference of interpretation, it is, that the origin of the present human race was from one single pair. . . . . Humanity proper, or the human proprium, did not *grow*, was no work of nature, but had a divine, a supernatural, an instantaneous beginning. There was a time, a moment, when man — *a* man — the *primus homo* — began to *be*, who a moment before *was not*. There was one in whom humanity commenced, and from whom all subsequent humanity has been derived. There was one who first began to be a man; and this principium has its date from the first energizing of that higher life which came from a direct inbreathing of the Almighty and Everlasting Father of Spirits."

It is upon this subject that the atheistic materialist resolutely antagonizes the Bible. Man, as it is claimed, in common with all brute creations, is a development from lower orders.

But it must be confessed that the evidence of this assumption is far from satisfactory. Indeed, it is so far from satisfactory, that the majority of scientific men are inclined to reject the hypothesis of man's evolution from the inferior species.[27] For instance, the distance between man and the rest of the animal kingdom is now generally admitted to be nearly, if not equally, as spanless as that between the non-living and the living. When comparisons are instituted as to the cubic capacity of the brain, the results are scientifically startling. The size of the brain

of the highest apes is thirty-four inches, and of the lowest man sixty-eight inches; here hundreds of continuous links are required, but not one, after forty years of the most diligent search, has been discovered. Von Bischoff and Welcker have shown, furthermore, that there is a fundamental and bridgeless distinction between the orang-outang and the human brains, not only from the size, but from the important physiological fact that their evolutions take place in opposite directions. The latest report is, therefore, that the development of man from the orang is, from their internal structure, an utter impossibility. Mr. Minot and others have agreed that man and related animals are more nearly connected with the common earth-worm than with any other animal.

In the matter of speech and as to the monitions of conscience, and in all æsthetic tastes, the chasm deepens and widens. As Sir George Mivart has said: "The gorilla is no less a brute and no more a man in all distinguishing characteristics than is the humblest member of the monkey family to which he belongs." Darwin, too, admits that the utter absence of links between apes and man is amazing.

Mr. Wallace, a disciple of Darwin, though differing from him in several points, ably maintains that natural selection in no possible way could have endowed the wildest savage with a human brain, which in size is but slightly inferior to that of the profoundest philosopher. His exact language at this point is the following: "The brain of prehistoric and of savage man seems to me to prove the existence of some power, distinct from that which has guided the development of the lower animals through their ever-varying forms of being."

Mr. Wallace also confesses that natural selection could not have given to other mammalia a hairy covering thickest upon the back, but to man thickest, when it exists at all, in front; or have made the hand and the foot of the savage perfect, adding no improvement in cases of the highest culture; or have perfected the human larynx, or have given power to conceive of God and immortality.[27] Professor Dana adopts a modified form of evolution, yet the following is his recent statement of the point before us: "If the links between the lower orders and man ever existed, their annihilation without trace is so extremely improbable that it may be pronounced impossible." Almost the last words of

Agassiz were these: "For the development of man, gifted with high reason and will, and thus made a power above nature, there was required a special act of a being above nature, whose supreme Will is not only the source of natural law, but the working force of nature herself. This I still hold."

Professor Schmidt, Dr. Rud. Virchow, with a few others who are of the extreme wing of evolutionists, believing even in spontaneous generation and kindred views, have likewise admitted, not only that no links have been discovered between man and apes, but that none exist, and that none have ever existed. They then start the ingenious supposition that man and apes have sprung from some lower animal, and have developed in different directions. Dr. Rud. Virchow thus states the hypothesis:

"The natural deduction, therefore, seems to be that by progressive development *an ape can never become a man;* nay, rather, that this very development has created the deep gulf between them. . . . . All attempts to transform our problems into doctrines, to introduce our theories as the basis of a plan of education, particularly the attempt simply to depose the Church, and to replace its dogma by a religion of descent — these attempts, I say, must fail. . . . . We cannot teach, we cannot designate it as a revelation of science, that man descends from the ape, or from any other animal — we can but designate this as a problem."

But how long must we wait for a solution of this problem?

Professor Agassiz, Jr., in a very interesting and exhaustive paper upon *Sea Urchins*, before the late American Association, utterly despairs of finding the missing links which have been so zealously searched for during the last twenty years. He concludes his address with the following biological inferences:

"But we can go no further with confidence, and bold indeed would he be who would attempt, even in a single state, to trace the genealogy of the inhabitants from those of ten years before. We had better acknowledge our inability to go beyond a certain point; anything beyond the general parallelism I have attempted to trace, which in no way invalidates the other proposition, we must recognize as hopeless. . . . . Ordinarily, the twigs of any genealogical tree have only a semblance of truth; they lead us to branches having but a slight trace of probability — to branches where the imagination plays an important part, to main limbs where it is finally allowed full play in order to solve with the trunk, to the satisfaction of the writer at least, the

riddle of the origin of the group. It seems hardly credible that a school which boasts for its very creed a belief in nothing which is not warranted by common sense, should descend to such trifling. . . . . These stages are the true missing links, which we can no more expect to find preserved than we can expect to find a record of the actual embryonic development of the species of the present day without direct observation at the time. The actual number of species in any one group must always fall far short of the possible number, and for this reason it is out of the question for us to attempt the solution of the problem of derivation, or to hope for any solution beyond one within the most indefinite limits of correctness. If, when we take one of the most limited of the groups of the animal kingdom, we find ourselves engaged in a hopeless task, what must be the prospect should we attack the problem of other classes or groups of the animal kingdom, where the species run into the thousands, while they number only tens in the case we have attempted to carry out? Shall we say 'ignorabimus,' or 'impavidi progrediamus,' and valiantly chase a phantom we can never hope to seize?"

In 1857, a skull was found between Düsseldorf and Elberfeld (Germany), since known as the Neanderthal Skull. It has been extensively written about by Buck, Huxley, Barnard, and others. A few weeks since this relic, which has been claimed to be that of a being which links the brute to the human species, was presented before the British Association at Swansea by Professor Schaafenhausen. The conclusion of the Professor was, that it is the skull, not of a semi-brute, but of a veritable human being. Professor Rolleston, commenting upon the skull, "announced his unhesitating concurrence with the German Professor, that the skull, exhibiting though it did such low development, was not that of an ape, nor of an idiot, but that of a savage man about fifty years of age, with a small brain no doubt, but evidently perfectly well able to hold his own in the struggle for existence. He was a man, and not the 'missing link.'"

No scientist present at that meeting of the Association objected to the views of these two distinguished scholars.

Thus, out of breath, with divided ranks, extreme evolutionists no longer seek to bridge, by intermediate forms, the abyss between man and the gorilla, but they daringly venture to bridge the deeper and broader gulf between man and the anthropomorphous apes on the one side, and some unknown animal on the other. How modestly Schmidt puts the case: "What future times may, perhaps, discover are inter-

mediate forms which go back to the common point of derivation of the present apes and of man." "*May!*" "*Perhaps!*"

We need not multiply references and quotations. We hazard nothing when saying that there is not an eminent scientific man living who dares now question the statement that not "a single plank on which one can tread with a firm foothold has yet been laid over the chasm which separates the human body, mind, and soul from the most advanced species of the brute creation."

Several positions can now be assumed without fear of controversy. For instance, there was a time when man was not; he could not have originated from nothing, or by nothing; there is no clearer evidence upon the exactest scientific grounds that he was evolved from either moss, worms, or orang-outangs, than that he was a direct divine creation. We therefore challenge any scientific man of whatever school to show that it is unscientific or unphilosophical to adopt the Bible account as the wisest hypothesis or solution yet offered in explanation of the perplexing problem of man's origin and development.[28]

But this account will bear a more rigid examination than we have yet given it. Involving with that account other points of Christian theology, we are led to recognize in the "Creator" of the Mosaic record the "Christ" of the New Testament. The "God-said" of Genesis is the "God-word" of John's Gospel. Moses introduces his account with the words, "In the beginning God created the heaven and the earth." John introduces his gospel with the words:

"In the beginning was the Word, and the Word was with God, and the Word was God. The same was in the beginning with God. All things were made by him; and without him was not anything made that was made."

The Apostle Paul thus expands and emphasizes this thought in the Epistle to the Hebrews, first chapter:

"God, who at sundry times, and in divers manners, spake in time past unto the fathers by the prophets, hath in these last days spoken unto us by his Son, whom he hath appointed heir of all things, by whom also he made the worlds. . . . . Unto the Son he saith, Thy throne, O God, is for ever and ever; a sceptre of righteousness is the sceptre of

thy kingdom. Thou hast loved righteousness, and hated iniquity; therefore God, even thy God, hath anointed thee with the oil of gladness above thy fellows. And thou, Lord, [the "God-said," the "God-word," the "Christ,"] in the beginning hast laid the foundation of the earth; and the heavens are the works of thy hands."

Christian theology, furthermore, reports that this "God-word," though invisible, is still present with his people; that he appeared in Judea eighteen hundred years ago, in the form of a divine man, or "God-man"; that before this he had frequently appeared in visible angelic shape to the patriarchs, and that not far from six thousand years ago, somewhere in Central Asia, in a place called the Garden of Eden, he appeared, and, as a miracle-worker, from the dust of the earth built up a material human body in the image of his own spiritual, eternal, and to us at present invisible, body or organism. The Mosaic record is explicit: "The Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul." Professor Murphy translates the passage thus: "And the Lord God formed the man of dust from the soil." It has been well remarked that "there is a deep significance in the phrase, 'from the dust of the earth.' High as may be our celestial parentage, we have an earthly mother. The most touching appellations in all languages are expressive of the idea. Man 'is of the earth, earthy.' He is *Adam*, he is *homo*, *humus*, *humilis*. If he has a spiritual life which connects him with the higher worlds, he has also an animal, and even a vegetable life, that links him with all below."

In this connection it is worthy of note that chemical analysis, after the most rigid examination, is able to detect the presence of no element in the human body which is not found in the dust beneath our feet.

Thus the body was full formed by immediate creative agency, and then the God-word breathed into the nostrils of this fresh-formed body "the breath of life"; and man became a living soul.[29] The meaning is, that the God-word energized a thinking soul in the body he had made. This miracle of man's life was wrought with mouth to mouth, as if Christ designed to wake man to consciousness with a kiss upon his lips. And history shows that with the tenderness of that first act the

Creating One ever since has followed his obedient children. And more than this, the world of philosophy and science acknowledges the presence in man of exceptional soul-gifts and graces. M. de Chateaubriand propounds a very interesting question, and furnishes a suggestive answer: "Why does not the ox as I do? It can lie down upon the grass, raise its head towards heaven, and in its lowings call upon that unknown Being who fills the immensity of space. But, no; content with the turf on which it tramples, it interrogates not those suns in the firmament above, which are the grand evidences of the existence of God. Animals are not troubled with those hopes which fill the heart of man; the spot on which they tread yields them all the happiness of which they are susceptible; a little grass satisfies the sheep, a little blood gluts the tiger. The only creature that looks beyond himself, and is not all in all to himself, is man." Darwin is right in his estimate that "man is the wonder and the glory of the universe."

In a word, every branch of science, and every principle of philosophy, confirm one of the first announcements of biblical theology — this: that the Almighty, in crowning man, has completed an exceptional piece of work. Every creature bows, as God solemnly announces man's final inauguration in the sublime words: "Have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth." Thus it remains unalterable from that day to this; six thousand years have made no changes. Man, in his exaltation or humiliation, in his civilization or barbarism, is still the monarch of every inch of this earth he inhabits.

The account of the origin of woman, the companion of the man, through whom all other thinking souls have originated, is given in the following words:

"And Adam gave names to all cattle, and to the fowl of the air, and to every beast of the field; but for Adam there was not found an help meet for him. And the Lord God caused a deep sleep to fall upon Adam, and he slept; and he took one of his ribs, and closed up the flesh instead thereof. And the rib which the Lord God had taken from man, made he a woman, and brought her unto the man."

This language necessitates the idea of a sudden and supernatural

formation of the material organism of woman. Does some one object because certain difficulties present themselves? But, we may ask, are there fewer difficulties attending any other supposition? May we repeat: There could have been no first child without a woman; and there could have been no first woman unless she had grown from a child, or have been full formed by supernatural power. The first child or the first full-grown woman could not have sprung from the ground without supernatural aid. She could not have made herself. The man could not have made her. There is no evidence that she was developed from lower orders. She must have been some way made. No greater difficulty attends the formation of woman in the manner recorded in Genesis than in any other way. Indeed, upon all modern theories of bioplasm, fewer difficulties attend this Bible method than attend any other method that can possibly be named.

Examine the details of this remarkable account. Heroic treatment was the one known to the ancients; they would have had the gods bound Adam to a rack, and then have had them wrench a bone from his side. But the Lord, the God-man, the Christ and Creator, caused a deep sleep to fall upon Adam. The most approved modern medical science could have done no better. The man, to employ a chemical term, was "etherized." The words "deep sleep" mean entire unconsciousness. Then the Divine One removed some part of the flesh and bone of the man near the breast, closing up the place thereof with other flesh, (a perfect though rapid healing process,) and out of this flesh, bone, and blood of Adam, with the bioplasts still alive in it and upon it, he made the woman. In the language of the original text, "And God builded up a woman." [30]

No one doubts that the Creator could have made woman in some other way as well as in the way recorded. He could have made her from a cloud in the atmosphere, or from the foam of the sea, or from a piece of mountain granite. But he could not have created her in any other manner that so well establishes the intended and ordained union between husband and wife; — a union so well established, in the nature of things, that a departure from it is always found destructive of the highest individual and national prosperity. "It is worthy of note," as

Herder remarks, "that what Moses adds is an elegant description of the espousal," and as there was no other to act, God himself honored the first marriage "by appearing as bridesman," or, in the beautiful language of the original, "And he builded up the woman and brought her to the man." Here was the birth of society. Unity of blood is literally maintained.[31] Here is the "real presence" and a Divine succession.

As the Creator looked upon that first society and the garden home, he could well say, as he actually did say: "And God saw every thing that he had made: and behold it was very good."

In view of all these considerations, is the Bible student extravagant in saying that the Mosaic account of man's origin is the only one ever propounded with which so many facts of science and philosophy, of providence and theology, as perfectly harmonize? But every philosopher, if true to the fundamental principles of philosophy and science, must accept for his working hypothesis the theory with which the larger number of facts agree. In other words, the world, upon purely scientific grounds, must accept the Bible account until a better one is propounded. But a better one, according to Christian belief, will never be propounded.

SUPPLEMENTAL NOTES.

NOTE I. (*Page* 9.)

IT appears to a thoughtful man well-nigh fatal to the credibility of the Bible to take the position that without detriment it may be inaccurate in its statements upon all subjects except those that are moral or theological. Yet not a few hold such an opinion. Dr. Frederick Stevenson, in a late address before the University of Vermont, employed language which represents this class of writers:

"In my view, — and I say so frankly, — it is a mistake to expect scientific accuracy in the Scriptures. They were not meant to teach science at all, and I see no proof that the writers spoke anything on scientific subjects but the current ideas of their times. They knew nothing of astronomy, or chemistry, or physiology, in the modern sense of those words; and they did not need to know. They had to do with God, the soul, righteousness, the evil of sin, the blessing of goodness; not with planets, or acids, or the theory of digestion. . . . . They were not bound to do for us what we can do for ourselves, and what they could not possibly have done without using language unintelligible or incredible to every generation before the present. We talk of scientific difficulties in the Bible now; but who in the ancient world would or could have believed the Sacred Book if it had stated the correct theory of astronomy? Remember, they had no telescopes, no scientific instruments or calculations, and the theory would have contradicted the plain evidence of their senses all the time. They could not have believed it. Difficulties! Our difficulties are as nothing to these. A book, to be believed, must be understood; and accurate science prematurely written would be unintelligible gibberish or incredible paradox. A very little thought will show us that a book intended for all the ages cannot possibly anticipate scientific discovery. Had the Bible done that, it would never have been read believingly till the history of the human race was complete and the millennium fully come."

It will be noticed that the fallacy underlying this reasoning is, that the Bible is purely a man-made book. The question is not, therefore, whether the writers understood all science, but, were they God-inspired. If so, all allusions to science should be correct. God must have known.

The statement of Dr. Stevenson, that a book intended for all ages cannot possibly anticipate scientific discovery, is too sweeping. A divinely inspired Bible must pre-

sent facts not as men may think or desire, but correctly and truly. In this connection it is worthy of remark that men have repeatedly antagonized the Bible upon this very ground, that it has anticipated scientific discovery. Said the late Professor Lyell: "In the year 1806 the French Institute enumerated not less than eighty geological theories which were hostile to the Scriptures, but not one of these theories is held to-day." It ought not to disturb any friend of the Bible that certain false theories of scientists are opposed to it.

In a word, the Bible nowhere asks at our hands any cowardly defence, or anything like special pleading. When, therefore, the man of *partial* belief in Revelation says, "The Bible was not intended to teach science, therefore we can excuse all scientific inaccuracies," we reply: No; for if the Bible has allowed itself to employ false statements as to the truths of nature or the truths of mind, then it no longer bears the impress of a book inspired of God, but bears the marks of a purely human origin, and belongs among those books which may shortly become obsolete and forgotten. If allowed at any one point, there would be scarcely any limit in this process of excuse-making. For some one else, with just as great consistency, could say that the Bible was not intended to teach any of the departments of human philosophy, therefore we may excuse its errors in philosophy. Another could say, The Bible is not intended to teach history, therefore historic misstatements in the Bible may be allowed; and if they exist they do not invalidate its credibility, for the Bible was not designed to teach history. Mr. Murray, in one of his sermons, employs this language: "The Bible is a book that should be read like other books, in a broad and comprehensive way. . . . . The length of the creation period, the tonnage of the ark, Samson's strength, the guerilla skirmishes of the Judges, the rams'-horn signals in front of the walls of Jericho—these are questions about which no sensible Christian cares a fig." Now, for our part, we do care whether or not the *facts* recorded in the Bible are true or false. Their truthfulness or their falsity makes all the difference imaginable as to our faith in the Book.

We are much better pleased with the confession of faith as stated by Sir John Herschel: "All human discoveries seem to be made only for the purpose of confirming more and more strongly the truths contained in the Holy Scriptures."

Note II. (*Page* 9.)

The theologian as well as the scientist has an unquestioned right, when seeking the solution of a problem, to adopt what is termed "a working hypothesis." This is a supposition which, at a given moment, harmonizes better than any other supposition with all the known facts bearing upon the case. The true scientist will abandon a given working hypothesis for another, the moment a better one is presented. In presenting his exposition of the nebular hypothesis, which has since become so celebrated, Laplace says: "I present this hypothesis with the distrust which everything ought to inspire that is not a result of observation or of calculation." Thus Laplace showed

the true spirit in not claiming for his hypothesis infallibility. "In astronomy there is no final human authority, no synod or council," says a distinguished astronomer, "but simply an appeal to reason and observation. If a theory or a discovery be true, it will stand the test of observation and of calculation; if false, it must pass away to that Miltonian limbo where so many things have gone and are going."

Note III. (*Page* 11.)

The nebular hypothesis as framed by Laplace, supposes that the matter of the solar system existed originally in the condition of a vast, revolving, and fiery mass, which gradually cooling and contracting, threw off, in obedience to physical laws, successive rings from which subsequently, by the same laws, were produced the several planets, satellites, and other bodies of the stellar universe.

Note IV. (*Page* 12.)

Scientific men have made use of various suggestive terms to express their view of the creative and sustaining power of the universe. Herbert Spencer employs the words "Unthinkable" and "Unknowable." Professor Bain speaks of matter as "a double-faced Somewhat, having a spiritual and a physical side." Professor Clifford employs the word "Cosmos," holding up the thing represented by that word as an object deserving worship. Strauss tried to rid his mind of the idea of God, but the universal beauty and fitness of things compelled him to see a something which he called "The All, existing in and for itself eternally." In his work entitled "Old Faith and New," he goes still further, and says, "We demand the same piety for our Cosmos that the devout of old demanded for his God." Dr. Lycock, followed by Mr. Murphy the scientist, designates the marvellous skill displayed in the universe as the product of "unconscious intelligence." "In the present state of our knowledge," says John Stuart Mill, "the adaptations of nature afford a large balance of probability in favor of creation by intelligence." Professor Tyndall often employs the words "inscrutable power." Mr. Mivart uses the words an "internal force," "a single form of force."

Note V. (*Page* 13.)

"The instability of the homogeneous," and its "tendency to the heterogeneous," appear to be a law applicable not only to the original formation of the physical universe, but also to its present order, both as to physical existence and social life. But law is not agency; it is method, the method of a lawgiver.

Note VI. (*Page* 21.)

The era following the Reptilian age, also the one following the age of monster Mammals, are very troublesome to materialistic evolutionists. Indeed, the hypothesis of pure evolution seemingly breaks down in the presence of this class of facts, in which the weaker supersedes the stronger.

NOTE VII. (*Page* 22.)

Since writing the foregoing quotation, we find that Professor Winchell has modified his views in a late work entitled *Preadamites*. The conclusions he reaches are the following:—*First*, The biblical Adam was a representative of the Mediterranean race, and was the remotest ancestor to whom the Jews could trace their descent. *Second*, The Bible itself clearly implies the existence of non-Adamites. *Third*, Races remote from Palestine in the times of Genesis, could not have descended from the stock of Noah. *Fourth*, The lower races could not have descended from the Mediterranean stock, because: (1) a vast diversification of races now exists; (2) some of these races are greatly inferior to the Mediterranean; (3) a complete differentiation of races existed in the early dynastic periods of Egypt; (4) and the chronological position of Noah, or even of Adam, is far too recent to suppose the differentiation began at the Noachic or even the Adamic era; (5) even the theory of the Hamitic origin of the Negroes is opposed by the Bible itself. (6) A chain of profound relationship runs through the constitution of all the races, and they may be regarded as genealogically connected together. (7) The initial point of the genealogical line may be located in "Lemuria," a hypothetical continent, now submerged by the waters of the Indian Ocean. (8) An early and profound split in the primitive stock is represented by the woolly-haired or African types, and the straight and curly-haired or austro-oriental types. (9) The African stock entered the continent somewhat north of the Equator, and dispersed thence southward and westward. (10) The smooth-haired stock sent one branch toward Australia, and another toward Central Asia. From the latter have proceeded all the Mongoloids, and from the former the Dravidians. (11) The Adamites are an offshoot from the Dravidians, and showed at first a closer approximation to the older type than is preserved in the Mediterranean race at present. (12) An early branch of the Mongoloid stock turned westward, and occupied Northern Africa, Atlantis, and the greater part of Europe, in times anterior to the Kelts or the Pelasgians. (13) The first men were geologically pre-glacial, and their antiquity is comparatively great. It may reach a hundred thousand years. Prehistoric Europeans were post-glacial, and their antiquity cannot be carried on archæological and ethnological grounds beyond five or six thousand years B. C. As to the creation of Adam, our author says: "Preadamitism does not exclude the current conception of Adamic creation. It admits that Adam was 'created,' but substitutes for manual modelling of the plastic clay the worthier conception of origination, according to a *genetic* method, and thus embraces the Adamic origin under an intelligible method of production, so sublime and significant as to include the whole world of organic beings. That higher perception, which is a function of reason, clearly discerns in derivative origins the perpetual presence and potency of a power which is in matter, but does not belong to matter. The derivation of Adam from an older human stock is essentially and literally the creation of Adam."

In reading this volume of Professor Winchell, every scholar will come to at least

three conclusions: *First*, The Professor is guilty of several self-contradictions. *Second*, So far as he attempts to build upon the Bible, he is guilty of pure arrogance in arbitrarily setting aside the verdicts of Semitic lexicographers and interpreters. Though an expert in science, Professor Winchell is not such in biblical exegesis. *Third*, So far as he attempts to advance beyond his earlier conclusions, he is exceedingly *suppositional*. An illustration is found in his discussion of *The Epoch of the First Man*. He says: "To the determination of this very little can be contributed. The earliest men left no records of themselves. The very country in which they lived has been swallowed up by the sea. Their monuments, if they created any, lie in the *bottom of the Indian Ocean*. Their bones, if undissolved, are mingled with the fossil remains which must await another geological convulsion for their discovery and investigation. But the indigenous races of Africa and Australia *may have* left some record which will shed light on the date of the occupation of those continents. *I imagine* that in some of the caverns of Abyssinia or central Australia *may yet be discovered* relics of man which *may* fix his epoch relatively to some geological event. The research is not a hopeless one. Science stands ready to undertake it; and *I doubt not*, the records of some geological or anthropological society will one day tell whether man lived in Australia or central Africa, as far back as the Miocene age of the world." The above italics are ours, and suggest that the Professor has advanced not into the realm of exact science, but into the shadowy domains of hypothetical poetry.

Note VIII. (*Page* 23.)

The importance of this subject may justify noting the liability of falling into mistakes as to the antiquity of human remains. It is a well-known fact that many discoveries, which for a time were thought to establish the great antiquity of man, though appearing in reputable scientific publications, are now distrusted or discredited. The connection of human and mastodon relics near Charleston, S. C., is a well-known instance. "The deposits here," says a writer who has made a careful study of this subject, "are so thin and superficial that it is very difficult to be sure that there is no mixture of different ages, the more so as the bones of the ordinary ox and the domestic hog are found also, neither of which were ever indigenous to this continent, and must, therefore, be specimens introduced by the modern settlers." Prestwick, a celebrated English authority, though still desirous of keeping up a high antiquity for man, says: "I do not, for my part, see any geological reasons why the extinct mammalia should not have lived down to comparatively recent times, possibly not farther back than eight or ten thousand years." And in another place he remarks, that "the evidence seemed to me as much to necessitate the bringing forward of the great extinct animals toward our time, as the carrying back of man in geological time."

Again, those who support the hypothesis of the great antiquity of man constantly assume that all geological changes have required vast periods of time for their accomplishment. But as a matter of fact, there have been great changes in brief periods.

For the following facts we are indebted to Mr. J. C. Southall, Georg Adolf Ermann, and Sir Charles Lyell: —

In 1819 the British part of Sindree, in India, to the extent of two thousand square miles of territory, was, in the space of a few hours, permanently submerged. Later, another portion of Sindree was elevated, converting Sindree Lake into a salt marsh, and forming the elevation of Ullah Bund (Mound of God).

In the Santosin group of the Ægean Sea new islands have suddenly appeared, the latest within comparatively a few years. Between 1795 and 1812 a lake near Ural, Siberia, sunk two hundred and ninety-one feet.

Ermann, in his "Travels in Siberia," says:

"The ground in Yakutsk, the internal condition of which was found in sinking M. Shergin's well, consists, to the depth of at least one hundred feet, of strata of loam, fine sand, and magnetic sand. They have been deposited from waters which at one time, *and it may be presumed suddenly*, overflowed the whole country as far as the Polar Sea. In these deepest strata are found twigs, rocks, and leaves of trees of the birch and willow kinds. Everywhere throughout these immense alluvial deposits are now lying the bones of antediluvian quadrupeds along with vegetable remains."

In the years 1826 and 1827 a succession of earthquakes so changed the level of the land along a coast in New Zealand that the sealers could no longer recognize the locality; and a hull of a vessel, supposed to be the "Active," lost some thirty years previously, was found two hundred yards inland, with a tree growing through its bottom. At another earthquake in the same group, in 1855, a tract of land equal to four thousand square miles is believed to have been raised from one to nine feet.

In 1772 the volcano Papandayang, in the island of Java, had a great eruption, by which its summit sunk, or lost in some way, four thousand feet of its height.

The famous earthquake in Lisbon is well known, by which prodigious physical effects were suddenly produced. Sixty thousand persons were destroyed in six minutes, the quay of the city sunk into an almost fathomless abyss, and the shock was felt from North America to Sweden.

The beach on the Frith of Forth, in Scotland, has risen not less than twenty-six feet since the time the Romans ruled the country.

In Peru, in 1746, an earthquake destroyed Lima, and sunk a part of the coast of Callas, so as to convert it into a bay.

In 1812 a series of earthquakes occurred in the region around New Madrid, on the Mississippi. A change of level was effected so suddenly that at one place the river for a while reversed its course. Lakes twenty miles long were formed in an hour, and a region seventy-five miles long and thirty miles wide is now known as the Sunk Country.

The disposition that could be made of human remains by some of these convulsions will suggest the unreliability of this class of evidence so freely quoted by advocates of the great antiquity of the human race.

There is equal uncertainty as to the age of human remains found in various geological deposits which have not suffered from these sudden convulsions. Notoriety was given, a few years since, to a human pelvis, found, along with bones of the mastodon and megalonyx, lying loose in a ravine near Natchez. "The trouble about this specimen," says a reviewer, "is that the Indian graves at the tops of these bluffs are continually caving down, and mingling their relics with objects at the bottom. This class of specimens is notoriously uncertain, and no experienced scientist attaches any significance to them."

Some years ago two men took a finely-developed Indian skull from a cave in the side of the valley, and placed it in a mining-shaft, intending to have it fall into the hands of Professor Whitney as a practical joke. It was successful. A workman took out the skull, and afterward gave it to the Professor, who was so satisfied with the evidence of its authenticity that he neglected to have the shaft pumped out (it was full of water at the time of his visit), to examine the ground, and see whether the cave-stalagmite adhering to the skull could be accounted for on the supposition of its original lodgment in the gravel of the pit. He was effectually deceived, and believed the skull to be of Pliocene age. A well-known and thoroughly reliable clergyman in California is brother to one of the men who placed the skull in the shaft, and testifies to the fact of the whole thing being a joke.

There has also been much written upon the antiquity of man based upon the relation of the stone, bronze, and iron age to one another. The following facts are taken, nearly in full, from a careful reviewer of this subject. While, according to this authority, it is generally true that stone is earlier than bronze, and bronze than iron, still, as a matter of fact, they are very much mixed, and sometimes inverted, as in the ruins of Troy, where Schliemann found a Stone Age later than bronze and iron both. A similar mixture is found in Mexico and Peru, whose inhabitants used both bronze and stone habitually. A bronze cell was found in one of the oldest Egyptian pyramids; while flint implements are found in European dolmens and *tumuli*, dating as late as the fourth and fifth centuries. The Chinese annals show that stone weapons were used in that country at least as late as between A. D. 964 and 1279. Stone axes (chi-fon), stone knives (chi-t'ao), a stone sword (chi-kien), and a stone agricultural implement (chi-jin), are also mentioned.

In the ancient monarchies of the valley of the Euphrates metals were well known. Rawlinson says (*Five Great Monarchies*) that "in the very first age of Babylonia a civilized people used stone and metallic implements together." "In the Chaldean plain the tombs and ruins have yielded," says Smith (*Ancient History of the East*), "knives, hatchets, arrowheads, and other implements both of flint and bronze, . . . chains, nails, fish-hooks, etc., of the same metal, . . . leaden pipes and jars, . . . armlets, bracelets, and finger-rings of iron." Under the great stone bulls of Nineveh, which had never before been disturbed, Mr. Place found knives of black flint along with "bracelets and necklaces of carnelian, emerald, amethyst, and other hard stones polished and fashioned in the shape of beads and the heads of animals."

The Ethiopians of the Upper Nile, in the time of Xerxes, had attained a high civilization, yet their contingent to Xerxes' army used stone arrow-points and horn javelin-heads, — a striking case of flint implements being used while bronze and iron were well known.

Rosallini, the companion of Champollion and other explorers, stated long ago that knives and other articles of flint have repeatedly been found in the tombs by the side of the Egyptian mummies. At the meeting of the *Institut Egyptian*, M. Mariette Bey used this language: "The fact that there are found (in Egypt) flints worked by the hand of man cannot be contested. . . . The flints in question do not go back to the age of stone. They belong to the historic age of Egypt. . . . In all historic antiquity, even to the time of the Ptolemies, flints were worked on this plateau. . . . With the flints they made knife-blades, which they fixed in handles of wood. One finds them even among the Greeks. These knives are sometimes toothed in the form of a saw. In the third place they made lance-heads."

In Abyssinia the Bogos still use both flint and iron for implements. M. Leemans says that an ancient Buddhist temple in Java, which was erected about A. D. 700, has its walls covered with bas-reliefs. These beautiful sculptures show perforated flint implements with wooden handles, and pile dwellings. Herodotus says that the Scythians east of the Caspian, at the time they defeated Cyrus, used gold and brass freely about their weapons and armor; but "they use neither iron nor silver, which indeed their country does not produce." According to this the eastern Scythians were in the Bronze Age when Cyrus was in the Iron Epoch.

Facts show conclusively the extensive use of stone with both bronze and iron, not only down to the Middle Ages, but even to our day.

"Possibly some future archæologist will puzzle himself over the millions of gun-flints used and lost by all armies fifty years ago."

Remains found in peat bogs have been supposed to prove man's great antiquity. But there are no accurate data. Take, for instance, the peat beds of Denmark. Mr. Hudson Tuttle thinks this peat is twenty-two thousand years of age; Sir Charles Lyell thinks that it may have been sixteen thousand years in forming; Steenstrup puts its formation at a *minimum* of four thousand; and Professor Worsade at not less than three thousand. These different estimates forbid anything like accurate scientific conclusions.

There is, on the Earl of Arran's estate in Scotland, a primeval bog and forest, which make it apparent that the pine, oak, and beech were not successive, but contemporaneous *at different levels;* the bog growing as well as the trees, (thus overtaking the upper species last.) Holes cut in the peat of this estate filled up at the rate of three inches a year.

Professor Worsade makes the statement that woollen cloth was found with the aboriginal relics of the Danish peat.

Where the Roman general Ostorius cut the forests of Scotch firs in Yorkshire, the

Hatfield Moss has since grown over an area of ninety thousand acres. At the bottom of the peat, many feet down, Roman axes and knives, with the stumps of Scotch fir, oak, &c., were found. Many of the trunks were hewn, bored, chopped, and split; and rails, wedges, bars, pieces of chain, horses' skulls, axes, and coins of the Roman emperors were found.

In Kincardine Moss, Scotland, Roman coins were found; also a Roman military road-bed of timber, over which eight feet of peat had accumulated. At Gröningen a coin of the Emperor Gordian, A. D. 237, was found under thirty feet of peat. In the Jura Mountains old iron furnaces are found, with Roman and Gallic coins of two thousand years or less of age. Over one of these furnaces twenty feet of peat had accumulated. In Derbyshire a grazier perished on a bog in a snow-storm. Twenty-eight years after, his body was found three feet deep in the peat. In the *Natural History of Stafford*, it is stated that coins of Edward IV. have been found eighteen feet down in the peat. Sir Charles Lyell states that at Lagore, in Ireland, relics of stone, bronze, and iron are found under fifteen feet of peat.

In the seventeenth century the Earl of Cromarty described to the Royal Society the origination of a new peat bog, which in less than fifty years covered up the trunks of trees fallen on it, and was thick enough to be cut for fuel. It is, therefore, hazardous to argue that human remains found in peat bogs carry back the origin of man to anything like great antiquity.

Geologists have also reasoned that human remains found in the mud deposits of the Mississippi prove the antiquity of the human race.

General Humphrey, while making a survey of the river, took elaborate observations during twelve months, at different points, to determine the amount of sedimentary deposit. He made it equal to a stratum one foot in depth by about two hundred and seventy square miles in area every year.

This action of the river produces many interesting phenomena, and has led to various efforts to determine the antiquity of the deposits. In digging for the gas works in New Orleans, the skeleton of a "Red Indian" was found, according to Dr. Dowler, at the depth of sixteen feet, and beneath four successive layers of cypress forest. Dr. Dowler endeavored to get an estimate of the general rate of mud accretion on the delta where New Orleans stands, and then, assuming it to be both correct and uniform, estimated that it would require fifty-seven thousand years to deposit the sixteen feet of material above the skeleton. Lyell was inclined to approve the calculation; but General Humphrey, in his elaborate survey, came to the conclusion that the whole ground of New Orleans and the surrounding country, down to the depth of about forty feet, was only four thousand four hundred years old.

Mr. Fontaine, Mr. Hurlbut, and others, state that, owing to the enormous rapidity with which the river changes its course, articles lost in the lifetime of men now living are in many places buried one hundred feet deep. Dr. Andrews saw cotton-wood saplings on the banks, with only seven rings of annual growth, over whose

original roots the inundations had deposited three feet of clay. There are streets in New Orleans where the water flowed a hundred feet deep sixty years ago. Mr. Fontaine gives an amusing statement that information reached the New Orleans Academy of Sciences that a piece of wood had been found at Port Jackson deeper down than Dr. Dowler's "Red Indian," and at a considerable distance from the river, and, moreover, showing workmanship by a high order of tools. Some members of the Academy investigated the relic, and found it to be the gunwale of a Kentucky flat-boat.

Says Fontaine: "The Mississippi, by undermining and ingulfing its banks with everything upon them, logs tangled in vines and bedded in mud, cypress stumps, Indian graves, and modern works of art, are suddenly swallowed up and buried at all depths by its waters, from ten to one hundred feet in depth." No scientist, unless he has a pet theory to maintain, would think of estimating lapse of time from this class of data.

Mr. H. C. Lewis, volunteer assistant upon the Pennsylvania Geological Survey, at the recent meeting of the American Association for the Advancement of Science, discussed the question of the age of the deposit at Trenton, N. J., containing articles of human workmanship. Dr. Abbott and other archæologists have claimed for these remains an antiquity coeval with the Glacial period. Mr. Lewis commenced by carefully defining the absolute and relative ages of all the clays and surface deposits of the Lower Delaware Valley. Three clays were pronounced to be of Mesozoic and Tertiary age. Next came the Philadelphia brick clay, stated to have been derived from the melting of the ice in the glacial period. No true glacial deposits exist south of the terminal moraine, near Easton, as first pointed out by Professor G. H. Cook. After the clay, three gravel deposits were laid down: first one, found on the tops of the hills, largely composed of pebbles of Potsdam sandstone; second, a red gravel, referred to the Champlain period; lastly, the Trenton gravel or sand, holding the human implements. These beds are therefore, geologically speaking, extremely modern. They follow the Champlain age, in which it is supposed human relics have been found elsewhere. Perhaps these Trenton beds correspond closely in age to the lower-level gravels of the River Somme, in France. Hence, they cease to be of importance in fixing a great antiquity for man in New Jersey. As the implements clearly belong to the Palæolithic age, they may cause archæologists to bring this ruder human period nearer to our own times. Mr. Lewis suggested that the name of Esquimaux period might be used to designate the period of the formation of the Trenton gravels.

In addition to the foregoing instances, we may add that the bones found at Saint Prest, in France, the shell marls of Léognan, near Bordeaux, the *Halitherium* bones at Puancé, and the flints of Thenay, which have been supposed to prove *Pliocene* or *Miocene* men, are now generally rejected by all careful scientists as evidence of the early antiquity of humanity.

The same may be said of the human skeleton found in volcanic breccia, near Le Puy-en-Velay, central France, the flints of the Somme Valley, the skeleton of Colle

del Vento, in Liguria, and the remains dug from the lava beds of California, which were for a time thought to be *Preglacial*. There is no cautious geologist who does not now hesitate to employ these cases in support of the great antiquity of the human race. Scientific men are less bold than formerly. As Mr. Southall states the case, "there has been in the past altogether too much assumption. It is assumed that it is unphilosophical to admit any more violent energies than those which existing operations present; it is assumed that the Glacial epoch is separated from our days by a vast cycle of time; it is assumed that the physical geography of the earth has not been substantially modified for tens, or hundreds, or thousands of years; it is assumed that it requires long ages to effect the extinction of a fauna; it is assumed that elevations and subsidences of land have occurred at the rate of two and a half feet in a century; it is assumed that the rivers of to-day are the same streams with the same volume of water which existed at the close of the Glacial period; it is assumed that it requires the sequence of innumerable centuries to effect a transition from a harsh to a temperate climate; it is assumed that because no great river-horses, or huge proboscisticus, or powerful carnivores roam in our age through civilized Europe, a long and protracted period must have intervened since the hippopotamus wallowed in the marshes of the Thames, and the cave-lion roared on the Mendip Hills." The address of Professor Ramsay, President of the British Association, at its meeting in August last, was an attempt to show, that, whatever may have been the state of the earth long before geological history began, all known formations are of a more recent date than geologists have generally supposed.

Says Chancellor Dawson:

"As a geologist, and as one who has been in the main of the school of Lyell, and after having observed with much care the deposits of the more modern periods on both sides of the Atlantic, I have from the first dissented from those of my scientific brethren who have unhesitatingly given their adhesion to the long periods claimed for human history, and have maintained that their hasty conclusions on this subject must bring geological reasoning into disrepute, and react injuriously on our noble science.

"We require to make great demands on time for the pre-human periods of the earth's history, but not more than sacred history is willing to allow for the modern or human age."

While thinking of this subject of the antiquity of man, we wonder, first, what skeptical scientists would say had the Bible announced that man has been upon this earth for one hundred thousand years, and that he originated from germs that came from "meteoric fragments," or from the "ether of space;" second, we wonder why the Bible did not make some of these statements.

These matters were certainly under quite general consideration at the time the Bible was written.

Ancient Persians taught that a tempest was the universal author of all existences.

The Buddhist tracts say: "The world appears to have been self-created, as it was natural at all times that the world should be self-created, and also perish of itself."

Thales, the Milesian, whom Plutarch regards as the first of philosophers, affirmed that *water* is the principle whence came all things in the universe, including the earth, the stars, and the gods, and into water all these things shall be resolved.

Anaximenes, also of Miletus, assigned the principle of all being to *air*, as Professor Barker lately assigned it to the *ether of space*. Anaximenes carried his views considerably further than does Professor Barker, claiming that as all things came from air, so all things in the end will return to air; also that air is God. Thus also Diogenes, of Apollonia, taught that the air has supreme intelligence and is a creator. "It knows much," he said; "for it has arranged things in the best and most beautiful manner." Anaxagoras held that *homogeneousness* is the cause of all things.

Pythagoras, the first who gave to philosophy its name, deduced the origin of all things from *arithmetical numbers*, which in certain combinations result, he says, in a producing force.

Heraclitus and Hippasus held that *fire* gives being to all things, and is that by which all things reach their end.

We repeat the question, Why did the Babylonians, the Egyptians, the Assyrians, the peoples of India, the masses of China, — why did Herodotus, Thales, Pythagoras, Aristotle, Plato, Zeno, Epicurus, and other Greeks and many Romans, differ from the Book of Genesis? These men looked upon the same skies, walked the same earth, had before them the same sources of information as did Moses. Why did they not reach the same conclusions? Or how may we explain whence the great Jewish lawgiver obtained information that enabled him, without making a mistake, to employ words that so exactly answer all the demands of modern scholastic criticism and scientific investigation? It must be allowed by every thoughtful person that this question cannot be set aside with a sneer, but that it ought to arrest attention, and receive from us sober and candid thought and reply.

Note IX. (*Page* 24.)

It has generally been held that two hundred feet of the summit of Mount Washington remained above the waters of the *Drift*. But Professor Young reported, before the late meeting of scientists in Boston, that he had found unmistakable evidences of drift-action quite near the summit. Later, after the adjournment of the Association, many of the members went on an excursion to the top of Mount Washington, where they inspected the evidences of glaciation of the summit. The largest transported bowlder found by them weighed nearly one hundred pounds, and corresponds perfectly with the rock occurring upon Cherry Mountain, ten miles distant and three thousand feet lower down. Hence, these figures express the distance travelled by this bowlder, both horizontally and vertically, in the Glacial age. The rock is entirely unlike that of Mount Washington itself; and as the bowlder was covered by the peculiar lichens growing naturally upon the summit, it could never have been brought there by human agency. The specimen has been taken to the rooms of the Boston

Society of Natural History. Near the Signal Service station may be seen a surface twenty or thirty feet long that has been evidently planed down by the ice; some of the surface recently uncovered still retaining its smoothness, and displaying obscure striæ pointing in a southeasterly direction. It has been recently stated by Professor Hitchcock that numerous moraines cover the sides of Mount Washington, such as were made in the decline of the ice period, when the glacier gradually retreated to the very summit, leaving blocks of stone arranged in curved lines or loops, with the convex side lowest. Inside of the loops the ground is smooth, comparatively level, and grassed over, representing the area occupied by the ice before it melted; while the stones occupy the steep escarpment of the terrace, and also show some parallelism with the general course of the moraine.

Note X. (*Page* 24.)

Says Le Conte: "The mammalian fauna of the *Quaternary* era was almost wholly peculiar, differing both from the *Tertiary* which preceded, and from the *Present* which followed it."

It is certainly and clearly evident that the few species of animals which may have survived the *Glacial* and *Drift* epochs had a difficult struggle for existence. They must have gone without much delay from their northern retreats to the distant uplands of the Tropics, and then, upon the change of that intense cold to the milder temperature, they must have very soon passed back over the desolations from which they had been compelled to escape. From the nature of the case, but very few, comparatively, could have survived.

Cautious geologists are ready to confess that the number of survivors is by no means firmly established.

Note XI. (*Page* 24.)

This qualification is allowed, because, as a matter of fact, few sciences have had to change their hypothesis more frequently than geology. As to the point now under consideration, it may turn out that what geologists have denominated the *Lost Intervals*, which we have called "nights," may be the great working periods, and that the so-termed periods of activity may really be the eras of repose. Still, whichever way viewed, the six great geological divisions remain perfectly distinct. The following additional grouping of the creative periods is given by Dr. Phin in his work entitled, *The Chemical History of the Six Days of Creation:*

THE SIX DAYS OF CREATION.

PERIOD.			WORK DONE.
First Day.	Evening	results from the primeval darkness existing from the beginning.	The creation of light, or the calling into activity of the physical forces.
	Morning	results from the chemical union and combustion of the elements.	
Second Day.	Evening	results from the cooling of the ashes of the great combustion.	The creation of the firmament, or the arrangement of the heavenly bodies and interstellar spaces.
	Morning	results from the light of the great Central Sun.	
Third Day.	Evening	results from the cooling of the earth and the deposition of dense clouds.	Elevation of the land, that is, the division of the land and water, and the creation of plants.
	Morning	results from the clearing away of the clouds and the shining of the Sun, day being rendered continuous by the enormous refractive power of the primeval atmosphere.	
Fourth Day.	Evening	results from the obscuration of the Sun by vapor.	The ordaining of the sun and moon as governors of day and night.
	Morning	results from the precipitation of this vapor and the clearing of the atmosphere, the refractive power of the latter being still sufficiently powerful to produce continuous day.	
Fifth Day.	Evening	results from the separation of Venus from the Sun.	Creation of fishes, reptiles, and birds.
	Morning	results from the restoration of the brilliancy of the Sun, which still shines continuously.	
Sixth Day.	Evening	results from the separation of Mercury from the Sun.	Creation of mammals and man.
	Morning	results from the restoration of the Sun's brilliancy.	

Note XII. (*Page* 28.)

Says Mivart in concluding an article entitled, *Likenesses, or Philosophical Anatomy:* "The teaching of what we believe to be true philosophy is that the types shadowed forth to our intellects by material existences are copies of divine originals, and correspond to prototypal ideas in God."

Dr. McCosh, in a treatise entitled, *The Development Hypothesis*, illustrates the thought before us thus: "We see branchings in the old club-mosses and the seaweeds in anticipation of the more perfect ramification in the tree. We notice flowers

radiating like the shell-fish which come at a later date. Insects have wings, prophetical of the better wings of birds. In the reptilian ages, we have monsters standing upright, and foretelling the erect form of man. There are thus in nature not only material causes, but final; not only efficient, but formal. We cannot allow this evolution doctrine to shear nature of its grandeurs, nor, we may add, morality of its binding obligations, or the universe of its God."

Note XIII. (*Page* 30.)

At this point we call attention to the fact that in addition to the Biblical scholars already referred to who favor the solar-day theory is Dr. Turner. In his *Commentary on Genesis* he says: "It is evident that all subsequent sacred writers who take notice of the creation as a work of six days do invariably assume a literal sense of the word 'day.'"

Writers, on the other hand, who have clung quite tenaciously to the so-termed "scientific periods," are Dr. Kurtz, Cuvier, De Luc, Jameson, Hugh Miller, Donald McDonald, Taylor Lewis, Chancellor Dawson, and Professor Dana.

Note XIV. (*Page* 32.)

The darkness of this day is well stated in Dr. Phin's *Chemical History of the Creation:*

"We have all seen the sun's face darkened by thunder-clouds when their black masses were driven by fierce tempests across his disc. From the cheerful light of day the change to intense gloom was rapid. The birds sought the densest shade, the wild beasts fled to their lairs, and men's faces grew pale as they gazed upon nature and upon each other. And yet all this was produced by clouds representing at most but a few inches of water.

"Again, we have seen a light, fleecy cloud of vapor floating away on a still day from a passing locomotive, and throwing down its shadow upon the green fields — a shadow black as ink. And yet, if all the water in this tiny cloud had been precipitated on the meadow over which it passed, it would not have deposited on the darkened area a depth of water equal to the tenth of an inch.

"What, then, must have been the darkness of that night when the clouds, which wrapped the earth as with a swaddling-band, contained water sufficient to have covered the whole surface of the earth to the depth of from four to five miles?"

We may as well here, as elsewhere, speak of the word translated in the authorized version "firmament," which we have translated "expanse."

The word in the original is "Rakia," whose verb meaning is to stretch or spread out; hence, literally, the substantive form means an expansion or extension.

That a "solid vault" need not be meant is evident from other passages, as "the fowl of the solid vault" is not sense. Thus also, "The way of the eagle is in the solid vault," and "He causeth his wind to blow in the solid vault," make no sense.

The early Jewish lexicographers translated this word by "extension."

David Kimchi, born 1160, one of the most distinguished Hebrews of the Middle Ages, gives the meaning "expanse."

All the early Spanish translators use the word *Espandidúra*, meaning "expanse."

The early German versions — those by Zunz, Arnheim, and Sachs — assign no other meaning than that of "expanse." Luther uses the word *feste*.

The next group of authorities is found among the French-Hebrew scholars who flourished at the revival of learning.

Vatablus, Peter Martyr, and John Calvin use *expansio in medio*.

So, likewise, Munster in 1588, Mercerus of the same date, Osiander in 1597, Valera in 1602, use *estendimiento en medio*.

Another group of authorities is found among German scholars of early date. Mariana, 1624; Hottenger, 1659; Schmidt, 1697; Baumgarten, 1749; Zeller, same date; Schults, 1783; Dathius, 1791; Ilgen, 1798; and Gesenius in his lexicons of 1810–13.

And we may add that nearly all the eminent lexicographers and commentators of the present century, except, of course, skeptical writers who are desirous of supporting some pet theory, or who are determined to make Moses say what he did not say, favor the foregoing translation of *rakia*.

Note XV. (*Page* 33.)

A third way of bringing about the above geological results would be by the elevation of the earth's crust. But as science now generally insists that the great upheavals of the earth have been, not rapid, but gradual and uniform, we do not include this method in our enumeration. Still, doubtless, we should have a perfect right to do so. (See Note VIII.)

We may at this point comment upon the words translated "without form and void." The words are *tohu* and *bohu*, confusion and emptiness; or, as Luther admirably renders them, *wüste und leer*. The Vulgate translates them, *inanis et vacua*.

It may be remarked that these terms do not often occur in Hebrew Scriptures, and yet the places in which they are found are such as unquestionably give their true meaning. In Deuteronomy xxxii. 10, *tohu* is used of the waste, wilderness, or desert in which the children of Israel were so long wandering. In Job vi. 18, it denotes the condition of the streams that disappear during the summer's drought. "They go up (evaporate) into *tohu*; they perish." So also, in Job xii. 24, we read: "They wander in *tohu*, where there is no path." In Isaiah xxiv. 10, *tohu* is applied to a ruined city. In Isaiah xl. 17, 23, xli. 29, xlix. 4, lix. 4; 1 Samuel xii. 21, it is used to denote what is utterly formless and worthless. Besides Genesis i. 2, there are two other places in which both words occur together. In Jeremiah iv. 24, we read: "I looked upon the earth, and it was *tohu* and *bohu*; I looked to the heavens, and they no more gave their light." "In this strange diorama the world would appear to be going back again

into the void and formless period. The mountains are unsettling; the hills move to and fro; man is gone; bird and beast have fled, and are to be seen no more. The representation strongly suggests Campbell's and Byron's vision of the Last Man, some features of which might seem to have been drawn from this very passage." The other passage is Isaiah xxx. 11. Speaking of the desolation of Idumea, the prophet says: "From generation to generation shall it be waste; forever and ever shall no one pass through it; for He will stretch upon it the line of confusion and the stones of emptiness," — the line *tohu* and the stones of *bohu*.

Note XVI. (*Page* 33.)

While many elevations and subsidences are gradual, as lately in Chili where there were a series of small paroxysms, and in Sweden where the movements were almost imperceptible, yet these facts in no way preclude the mighty, sudden, and destructive changes which elsewhere and at other times have convulsed the earth.

Note XVII. (*Page* 34.)

In a recent address before the *Torrey Botanical Club* of New York, Dr. Newberry argued that no new species of flora — to any extent at least — has appeared on the surface of the earth since about the time of the great ice period. He shows that the number of species before the Arctic irruption was much greater than now. As the ice flowed south, plants were driven from temperate atmospheres to warmer ones, which did not agree with them, and in some cases (like the Mediterranean Sea) met barriers they could not pass, and consequently were destroyed. A few on the American Continent could go further south than the same kinds in Europe; hence there was a possible chance of returning when the ice receded. Fossil remains show that the same species existed at one and the same time in Japan and China, in Europe and in America. None of these exist at present, except as fossils, in Europe, only a very few in America, but most of them in Japan. The ice not having passed much below where now is the Potomac, gave a chance for some of the magnolias, oaks, cypresses, planes, &c., to get back gradually over the area left by the receding ice-fields. In regard to the introduction of new classes of plants, Dr. Newberry finds no evidence of any gradual development of one from another. He finds no link that unites the naked-seed class, *gymnosperms*, with those enclosed in seed-vessels, *angiosperms*.

Note XVIII. (*Page* 35.)

It has been well said that next to the Bible, in its importance to man, stands the almanac. "The first nations had no other almanac than the rolling heavens. Spring and summer, ploughing, sowing and reaping time, were regulated by the rising and setting of certain constellations." Their usefulness is referred to by the Greek and Latin poets as well as by Bible writers. The thought is happily expressed by the old poet Aratus in the beginning of his *Phenomena:*

"The stars' propitious power he shows to men,
And high in heaven firm binds their ruling *signs*."

This is almost a free translation of the language of Moses: "He set them in the firmament for *signs*, and for seasons, and for days, and for years." Thus, also, Cicero speaks of the stars as "the moderators or *rulers* of those temporal vicissitudes by the accurate knowledge of which man is distinguished from the brute." — *Tusc. Quæs. I.*, 28.

Note XIX. (*Page* 42.)

The following critical discussion of the word *bara* is substantially that given some years since by Taylor Lewis: — The word בָּרָא seems to borrow some shades of its meaning from the kindred root בָּרַר, which has the sense of cleansing, or purification, from the primary ideas of separating, dividing, purifying, &c. So creation is a clearing up, a cleansing, or a bringing into order. It is an established principle of interpretation that the best understanding of the radical nature of any word is where both the larger and the more specific applications seem to unite in the same image. For such a passage see Joshua xvii. 18, where, in dividing the promised land among the tribes, it is said to the sons of Joseph: "The mountain shall be thine; for it is a forest, וּבֵרַאתּוֹ, and thou shalt clear it," — literally, cut it, hew it, separate it, clear it up. The reference is to the operation of bringing into order waste forest land, or turning the chaos, the *tohu* and *bohu* of the wilderness, into a well-arranged and cultivated territory. The primary sense of the Latin *creare*, whence our word "create," is somewhat different, though still presenting the same general idea of gradual process, or the production of one thing from another. This primary sense of *creare* is growth, as is more clearly seen in the derivative *cresco*, and as it manifests itself in our words "increase," "increment," &c. The generative sense is still more plainly exhibited in the compounds, whence our words *pro*create, *re*create, *con*create, &c. To go still farther back into the very elements of the primitive language, there cannot be a doubt that the Latin and the Anglo-Saxon words have each the same cognate radicals, CR and GR, and that therefore CReo and GRow present originally the same conception. The Greek φυσις has the same significance.

Note XX. (*Page* 43.)

Haeckel, in his *History of Creation*, thus states the case:

"At one part of the history of development (*i. e.*, at the beginning) we must have recourse to the miracle of a supernatural creation if we do not accept the hypothesis of spontaneous generation. The Creator must in that case have created the first organism, or a few organisms, and have given them the capability of developing further in a mechanical way. I leave my readers to choose between this idea and the hypothesis of spontaneous generation."

We are perfectly willing to leave our readers to decide between these two

hypotheses, especially since there is not the slightest evidence of the origin of life through spontaneous generation. (See pp. 43, 45, 46.)

Note XXI. (*Page* 45.)

We briefly note the meaning of some of the terms here employed. A *protoplast* is a thing first formed; *protoplasm* is the substance out of which this first thing is formed. It is chemically the viscid, nitrogenous material in all vegetable and animal life-cells.

Thus also of the terms "bioplast" and "bioplasm." A *bioplast* is a life-germ. Mechanically, bioplasts build every part of animals and plants. *Bioplasm* is the chemical composition of bioplasts. The *dynamical aggregates*, or *highly differentiated life-stuff*, of materialistic physicists, the *proligerous pellicles* of M. Pouchet, the *plastide particles* of Bastian, the *monas* of O. F. Müller, are, except in name, one and the same things with these *bioplasts* treated of so extensively by Professor Beal.

But not one of these men can give us any light as to the origin of the life of the bioplasts.

Note XXII. (*Page* 49.)

The argument of Professor Barker, showing that the protoplasm of plants and of animals is identical, is supported by the following facts:

Though the protoplasm of vegetables is enclosed within a cellulose bag, it is only a closely-imprisoned rhizopod. A still more striking evidence of this intimate relationship has been developed by Darwin in his researches upon insectivorous plants. Not only do these plants possess a mechanism for capturing insects, but they secrete a gastric juice which digests them. Another most curious proof of the identity of animal and vegetable protoplasm has been given by Claude Bernard, who has shown that both are alike sensitive to the influence of anæsthetics. A sensitive-plant exposed to ether no longer closed its leaflets when touched. Assimilation and growth, as well as germination, are arrested by chloroform. Schützenberger has proved that the fresh cells of the yeast plant breathe like an aquatic animal. It would seem, then, that the protoplasmic life of animals is identical with that of plants; a certain measure of destructive metamorphosis taking place in each, evolving energy and producing carbon-dioxide and water.

But it may be remarked that upon the closest examination the Professor is unable to find that either the plant or the animal can vitalize protoplasm. The origin of life in both the plant and animal is shrouded in mystery.

Note XXIII. (*Page* 50.)

Some of our readers may desire to know the distinction made between mediate and immediate creation. It is this: When the Creator produces something by means of an intervening object or agent, the action is termed "mediate"; that is, if the

creative act enabled the soil to originate plants or animals, it was a case of *mediate* creation.

On the other hand, if the creative act originated plants and animals without any intervening object or agent, it was a case of *immediate* creation.

Note XXIV. (*Page* 50.)

There are those who think they find a somewhat stronger warrant for the mediate creation of vegetation than we have claimed. The following is from Professor Taylor Lewis while commenting upon the passage before us:

"Here are two distinct things, — the going forth of the Omnific Word, as in the other creative periods, and the productive power, energy, or energizing of the earth. This latter is expressed by two different yet kindred Hebrew verbs. One of them, דָּשָׁא, means properly to germinate (Greek *βλαστῆσαι*; Vulgate, *germinare*), to bud, or to sprout, as in Joel ii. 22: 'For the pastures of the wilderness do spring, the tree beareth fruit; the fig-tree and the vine do yield their strength,'— *βεβλάστηκεν τὰ πεδία* — *Quia germinaverunt speciosa deserti*. There it is applied in Kal to the plant. Here in Hiphil it has for its subject the earth, — 'Let the earth germinate, or cause to germinate.' It is the casual or causative conjugation; and although we would not attach much importance to this standing alone and unsupported by the context, yet, in the connection in which we here find it, it is certainly worthy of note. The other Hebrew word means precisely what the English does, — to come forth; and, in the Hiphil conjugation which is here used, to cause to come forth, or out, to bring forth, — to give birth to, *nasci facere*, or cause to be born, which is the special sense it has in Job x. 18, Isaiah lxv. 9, and other places. The earth, then, was not a mere passive recipient, nor was production by it a mere outward, unessential mode, having no other than an arbitrary connection with the divine working, or employed merely as an accompanying sign; but the earth exerts a real causative power, and this becomes an essential and important part in the chain of causation which God saw fit to originate and establish. The divine power was exerted; but it was upon the earth and through the earth. . . . The command is to the earth; but the earth is not passive. She exerts an active obedience in the exercise of the old nature, modified by the new force which comes from the supernatural Omnific Word going forth, as it previously did for the separation of the light from the chaos, and the waters from the waters. Before it was said, 'Let there be light;' and now again, Let there be life, — and life began to be. As in all the other periods, so here there was doubtless the instantaneous beginning of a new, and at first supernatural, force put into nature. Vegetable life had a moment when it began to be, — a new thing upon the earth, unborn and undeveloped out of anything previously existing. The earth, by any natural power previously imparted or previously exercised, would never have produced it; but then, when the new energy is imparted, the mode, or law of production, is through the earth. . . . The first plants grew; they were made to grow in the earth, and by the earth, and

out of the earth. They were born of the earth; they were carried in her womb during their respective periods of gestation; their embryo, or fœtal, life was fed from her warmth and moisture; and they afterwards were nurtured and grew up, each to its perfection, on her maternal bosom. They grew; and growth is the cardinal idea of the word 'nature.'"

It may also be noted in this connection that it is claimed as established by nearly all scientists, that during geological periods the species arose in groups of like forms in many parts of the world at once.

Note XXV. (*Page* 52.)

It should be observed, however, that the difference between man and the lower orders, Biblically considered, is not made out from single words and phrases. The difference is deducible, rather, from the combined force of the entire context, supported by numerous facts. "Man," says the Scripture, "became a living soul" (נֶפֶשׁ חַיָּה). But the animals also are spoken of as having *nephesh hayya*, breath of life, or soul of life, or living soul. It is the general term for animation, like the Greek ψυχή, ἔμψυχος, including all that is not matter, whether we call it life, sense, feeling, or intellect, from the lowest sentient to the highest rational being.

Note XXVI. (*Page* 52.)

It is remarkable that scientific men are quite generally inclined to make a distinction between man and the rest of creation. The author of *Life: its True Genesis*, is in general representative. He says:

"The primordial germs of all living things, man alone excepted, are in themselves upon the earth, and they severally make their appearance, each after its kind, whenever and wherever the necessary environing conditions exist."

Virchow and Agassiz hold substantially the same view; also Professor Dana, who says:

"For the development of man, gifted with high reason and will, and thus made a power above nature, there was required, as Wallace has urged, a special act of a Being above nature, whose supreme will is not only the source of natural law, but the working force of nature herself."

Says Le Conte:

"From the purely structural and animal point of view, man is very closely united with the animal kingdom. He has no department of his own, but belongs to the vertebrate department, along with quadrupeds, birds, reptiles, and fishes. He has no class of his own, but belongs to the class Mammalia, along with quadrupeds. Neither has he an order of his own, but belongs to the order of Primates, along with monkeys, lemurs, &c. Even a family of his own, the hominidæ, is grudgingly admitted by some. But from the psychical point of view, it is simply impossible to overestimate the space which separates man from all lower things. Man must be set off,

not only against the animal kingdom, but against the whole of nature besides as an equivalent. Nature the *book*, the revelation, and man the *interpreter*.

"So in the history of the earth. From one point of view the era of man is not equivalent to an era, nor to an age, nor to a period, nor even to an epoch. But from another point of view it is the equivalent of the whole geological history of the earth besides. For the history of the earth *finds its consummation, and its interpreter, and its significance in man.*"

Note XXVII. (*Page* 52.)

While holding to the view that there has been a kind of evolution in the creation and fitting up of the physical universe, we still insist that there is no evidence that the evolution discovered is anything except a divine execution, according to a previously existing plan. Evolution has no power; it is simply a method. This kind of evolution is strictly Scriptural. (See Ps. cxxxix. 15, 16.)

Matter, likewise, has no intrinsic power; at least, none has yet been discovered. It can evolve or produce only as acted upon by some power outside itself.

Darwin was not atheistic in his conclusions; but certain materialists have since carried his views so far as to deny all supernatural agency. But these extreme views can be condemned upon strictly scientific grounds. They are self-condemned. There are, for instance, fatal breaks in the line of succession. There are new species repeatedly appearing for which no vestiges of ancestors can be found. To the claim that we *may* yet discover the intermediate links and the producing ancestors, it has been well replied that "for the present we must suit our hypothesis to the facts; and the facts show wide gaps in the succession." Haeckel has tried to derive the higher plants from algæ, or sea-weeds. "Nothing," says Dr. Dawson, "could more curiously contradict actual facts. Algæ were apparently in the Silurian neither more nor less elevated than in the modern seas; and those forms of vegetable life which may seem to bridge over the space between them and the land plants in the modern period are wanting in the older geological periods, while land plants seem to start at once into being in the guise of club-mosses, a group by no means of low standing. Our oldest land plants thus represent one of the highest types of that cryptogamous series to which they belong, and, moreover, are better developed examples of that type than those now existing. We may say, if we please, that all the connecting links have been lost; but this is begging the whole question, since nothing but the existence of such links could render the hypothesis of derivation possible." The same eminent authority assures us that "there are forms of life in the Silurian which cannot be traced to the Cambrian, and which relate to new and even prospective conditions which the unaided powers of the animals of the earlier period could not have provided for." Some well-known American geologists, in order to escape the involved difficulties, have favored the theory that instead of an unbroken series there has been once and again the sudden and abrupt introduction of new species; they cannot tell how. But this is begging the entire question when one attempts thus to do away with the supernatural.

The two classes of facts, however, which have figured most largely in support of pure naturalistic evolution are those connected with embryonic phenomena and rudimentary organs. Haeckel argues that embryonic phenomena prove the descent of the various species of animals from a common parentage by the operation of the law of "natural selection" and the "survival of the fittest." He shows that the human *fœtus* in the womb passes successively through the forms of fish, reptile, and quadruped before developing into man. We each in our unborn state have gone through these metamorphoses. And this, with all Darwinists, Haeckel claims is proof that the human race has been "generatively descended and derived through these successive gradational races." Now, while this is a wonderful parallelism, it is no proof. "There is no logical or causative relation discernible," says a careful scholar, "between the two lines of succession. The embryo, in its successive transformation, is an image or picture of the evolutional transformation through which the external animal world passes. One shows no causation of the other, and the embryonic series only illustrates the fact that there is an order of creation. But be it specially here noted, it does not illustrate *a generative order*. The succeeding stage of the *fœtus* is not *born* of the preceding stage. It fails, therefore, in the very vital point of illustrating the *generative* descent of later animal species from earlier. The embryonic stages are produced simply by changes of the relative positions of the molecules; but these changes do not embrace the process of sexual concurrence, parturition, and birth. If I take a mass of putty and manipulate it through exactly the same changes of form, I have precisely imaged the embryonic image of external evolutionary animal developments, and the successive stages are most surely not genetically connected. The successive changes of shape — that is, the successive changes of molecular position — are produced by the interposition of the formative forces proceeding from the hands. The process is an admirable image of, and comment on, the Mosaic text of the creative order of succession. It illustrates the divine fact that man is a microcosm, a miniature of the macrocosm, summing up all his created predecessors in himself, and rising in himself above them all. If there had been so many successive births in the womb of successive *fœtuses*, it would have been an illustration of Darwinism. But being only a formal *succession*, so far as it is proof it establishes a formative, but not a generative succession. But whatever the external *form* of a human *fœtus*, it never was at any stage a real fish, or tortoise, or dog. From the first seminal element to the birth it was a man and nothing else; that is, there resided in the human seminal essence at the first the formative power, superior to and overmastering all its forms, which did not reside in that of the lower animals."

Rudimentary organs, likewise, are claimed to establish the doctrine of materialistic evolution. Mr. Darwin tells us that the boa-constrictor has in the hinder part of the body some useless little bones, which, as he supposes, are the remains of lost hind legs. The mammals of the whale tribe, which have only fully developed fore legs (breast fins), have, further back in the body, another pair of utterly superfluous bones, which are claimed to be the remnants of undeveloped hind legs. Now these, and a

great variety of other rudimentary organs, Darwin, Tyndall, Huxley, and others declare are utterly inexplicable on any theory except that of evolution.

In brief, it will be noticed, that, according to the theory of evolution, the animal must always be developed upwards, for deterioration inevitably tends to ultimate destruction. But what are the facts in the case? If the useless bones in the hinder part of the boa-constrictor are rudiments of lost hind legs, then it has been developed to its present condition from an animal that had legs and could walk; that ancestor was developed from a former ancestor that had no legs, as the common ancestor had none. But it must be admitted that the possession of legs is an advantage over the non-possession of them. Hence, the logical conclusion is that natural selection, which, according to Darwin, "works on for ages unerringly, preserving every improvement and destroying that which has deteriorated," did develop, by almost countless slight successive modifications from some legless fish or mollusk, the boa-constrictor with legs, thereby improving its condition; but afterwards, through other almost countless generations, finally "aborted and took from it its legs, leaving in their place these little bones, for no other apparent reason than to aid evolutionists in proving descent by transmutation."

The evolutionist also says that the hump on the camel's back strengthens the back and aids in carrying heavy loads. He therefore claims that the hump was developed by the necessity for its existence. This argument is, however, anything but convincing to a thoughtful mind, since the hump is not of "an osseous nature," does not strengthen the back, and existed long before the camel ever carried a load.

Professor Haeckel still further theorizes that the whole family of whales and fish mammals (*cetacea*) were developed out of hoofed animals. But if this is the case, then, as has well been asked, "Why is the whale the only one which has the rudimentary hind legs? And if the theory is correct, evolution spent a hundred million years in evolving a fish into a bull, horse, elk, or some other hoofed animal, and then spent another hundred million years in degrading it back into a fish again, thus producing an effect the exact opposite of evolution; a transformation from the complex and heterogeneous back into the simple and homogeneous.

Many genuine fishes, we are told by Professor Haeckel, have lost their hind legs. But if this is the case, then "they have been developed downward toward the mollusk, and evolution works both ways, which is absurd, for then below the lowest Silurian strata may be found deposits containing the remains of fishes, reptiles, birds, mammals, monkeys, and men. Once admit that matter is eternal, and it would be easy to imagine this see-saw operation going on from eternity — natural selection putting legs upon a fish and making it a cow, and again taking them off and making it a fish!"

Mr. Darwin is sorely puzzled over the fact that the dugong and lamantin, which must have been developed into their present condition much more recently than the whale, have no rudiments of legs at all; but it seems never to have occurred to him that possibly neither they nor the whale ever had any legs, and that the boa may never have been anything but a snake. The simple fact is that this theory of rudi-

mentary organs is simply a muddle in the brains of its expounders, which not even Darwin pretends to understand. The theory of type and antitype, rather than evolution, is the natural, easy, and scientific solution of this class of phenomena.

Note XXVIII. (*Page* 56.)

The history of evolution theories is interesting. Since the time of Augustine, who thought that animals, by the power of God, might have come from the slime of the earth, scientific men have generally held that all plants came from seed, and all animals from animal parentage. But there have arisen, from time to time, those who denied the commonly accepted doctrine. De Maillet, at the beginning of the last century, argued that animals were originally formed in the waters which covered the earth, and were transferred to the land when it emerged, and then suited themselves to their new external circumstances. Lamarck, in 1801, started the theory that there is "an inherent principle of improvement in plants and animals, and that external conditions working on this produced gradually variations of species, which gave rise to new species, genera, and orders." *The Vestiges of the Natural History of Creation*, issued in 1844, produced a profound impression. It was ingeniously argued by the author that "creation took place according to law; and in particular, that simply a prolongation of the time of the development in the womb may give rise to a higher type." Universal attention was called to the subject of development when, in 1858, Charles Darwin, a very careful observer, published his work, *Origin of Species by Means of Natural Selection, or the Preservation of Favored Races in the Struggle for Life.*

Note XXIX. (*Page* 57.)

See Note XXV., p. 81.

Note XXX. (*Page* 59.)

The similarity of method adopted by the "God-said" in the creation of the first human pair, and by the "God-word" in working miracles in Judea, is striking. (See Luke xxii. 49–51; John xi. 1–54; Luke vii. 11–16; John ix. 1–38; Mark viii. 22–26; John ii. 1–11.)

Note XXXI. (*Page* 60.)

We may note the following opinions of distinguished men as to the unity of the human race:

Adelung, in his great work upon *Language*, says: "Asia has been in all times regarded as the country where the human race had its beginning, received its first education, and from which its increase was spread over the rest of the globe. Tracing the people up to tribes, and the tribes up to families, we are conducted at last, if not by history, at least by the tradition of all old people, to a single pair, from which families, tribes, and nations have been successively produced."

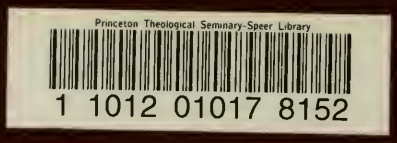
Says Dr. John Charles Hall, in his Introduction to Pickering's *Races of Men*: "We are fully satisfied that all the races of man are, as the Gospel clearly expresses it, 'of one blood,' — the black man, red man, and the white man are links in one great chain of relationship, and alike children which have descended from one common parent."

Buffon, in his *Natural History*, says: "Every circumstance concurs in proving that mankind are not composed of species essentially different from each other; on the contrary, there was originally but one species, which, after multiplying and spreading on the whole surface of the earth, has undergone various changes by the influences of climate, food, mode of living, epidemic diseases, and the mixture of dissimilar individuals."

Dr. Prichard, in his *Physical History of Mankind*, after speaking of the higher endowments of mankind, concludes thus: "When we compare this fact with the observations which have been heretofore fully established as to the specific instincts and separate physical endowments of all the distinct tribes of sentient beings in the universe, we are entitled to draw confidently the conclusion that *all human races are of one species and one family*."

W. Lawrence, F.R.S., in his *Lectures on the Natural History of Man*, says: "The human species has numerous distinctive marks by which, under every circumstance of deficient or imperfect civilization and every variety of climate and race, it is separated by a broad and clearly-defined interval from all other animals."

Chancellor Dawson, in *Nature and the Bible*, after surveying the early history of man, says: "We may so surely conclude that all the above coincidences cannot be accidental, and that what we know of primitive man from geological investigation presents no contradiction to the history of his origin in the Bible, but rather gives such corroboration as warrants the expectation, that, as our knowledge of prehistoric men increases, it will more and more fully bring out the force of those few and bold touches with which it has pleased God to enable his ancient prophets to sketch the early history of our species."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